Surveying and Mapping

April – June 1952

Quarterly Journal

AMERICAN CONGRESS ON SURVEYING AND MAPPING

ORGANIZATION OF THE CONGRESS

OFFICERS

President
GEORGE H. HARDING
Ohio State University

Vice President
WILLIAM T. PRYOR
Bureau of Public Roads

Executive Secretary
WALTER S. DIX
Maps and Surveys Division, TVA

Treasurer
RICHARD T. EVANS
U. S. Geological Survey

Editor-in-Chief
AARON L. SHALOWITZ
U. S. Coast and Geodetic Survey

BOARD OF DIRECTORS

	Term expires
SOL A. BAUER	1952
LOUIS H. BERGER	1952
ARTHUR W. KENDALL	1952
ARTHUR H. ROBINSON	1952
LANSING G. SIMMONS	1952
WILLIAM C. WATTLES	1952
TALBERT ABRAMS	1953
KENNETH T. ADAMS	1953
GERALD FITZGERALD	1953
ELMER C. HOUDLETTE	1953
ROBERT H. LYDDAN	1953
ARTHUR J. McNAIR	1953

PUBLICATIONS COMMITTEE

GORDON E. AINSWORTH — RAYMOND P. EYMAN — ARTHUR F. STRIKER
FRANK S. BORDEN — LESTER C. HIGBEE — MORRIS M. THOMPSON
K. T. ADAMS, *Chairman*

(*Congress organization continued on inside back cover*)

The American Congress on Surveying and Mapping is a non-profit association, organized to advance the sciences of surveying and mapping in their several branches, in furtherance of the public welfare and in the interests of both those who use maps and surveys and those who make them. It aims to establish a central source of reference and union for its members, to contribute to public education in the use of surveys and maps, and to encourage the prosecution of basic surveying and mapping programs, especially those programs which are paid for, in whole or in part, with public funds.

Annual dues in the CONGRESS entitle members to all the privileges of the CONGRESS and to all its publications.

For further information, write to

AMERICAN CONGRESS ON SURVEYING AND MAPPING

BOX 470, BENJAMIN FRANKLIN STATION, WASHINGTON 4, D. C.

SURVEYING AND MAPPING

A. L. Shalowitz, *Editor-in-Chief*
Robert C. Eller, *Assistant Editor*

A Quarterly Journal
Devoted to the Advancement of the Sciences
of Surveying and Mapping

Volume XII, No. 2
April–June 1952

PUBLISHED BY THE
AMERICAN CONGRESS ON SURVEYING AND MAPPING
BOX 470, BENJAMIN FRANKLIN STATION, WASHINGTON 4, D. C.

To provide for the suppliers of items used in surveying and mapping the unique opportunity of an outstanding ***advertising*** medium ideally suited for their market the

American Congress on Surveying and Mapping

has opened the pages of this Journal of Surveying and Mapping to ***Commercial Advertisers*** starting with the next issue, July-September 1952

For rates and data contact:

SCHALER, BUTLER & ASSOCIATES
PUBLIC RELATIONS AND ADVERTISING
1616 EYE STREET, N. W., WASHINGTON 6, D. C.

exclusive agent

Apr. • May • June • 1952

Contents

Volume XII
Number 2

ADVERTISING IN SURVEYING AND MAPPING ——— *Frontispiece*

THE ROLE OF SURVEYING AND MAPPING IN DEVELOPING THE ECONOMY OF NATIONS ——— 104
Dr. George H. Kimble

RESURVEYS OF ORIGINAL GRANTS IN NORTH CAROLINA AND OTHER STATES OF THE ORIGINAL COLONIES ——— 109
Grady S. Harrell

WINTER CONTROL TRAVERSE SURVEYS IN CANADA ——— 111
J. B. O'Neill

USING AVAILABLE CONTROL IN TEACHING HIGHER SURVEYING AND PHOTOGRAMMETRY ——— 118
Prof. Carl A. Egner

INTERPRETIVE CARTOGRAPHY ——— 121
William Davies

SUPPLEMENTAL VERTICAL CONTROL METHODS ——— 123
Edward Barthold

USE OF PLANE COORDINATES IN CALIFORNIA ——— 128
Czerny Anderson

SURVEYING AND MAPPING AND THE POINT 4 PROGRAM ——— 132
Dr. Henry G. Bennett

A PLANNED PROGRAM OF RESOURCE SURVEYS ——— 135
Fowler W. Barker

BOUNDARY PROBLEMS IN CARTOGRAPHY ——— 138
Arthur R. Hall

CONTROL SURVEYS IN ALASKA ——— 142
Capt. Albert J. Hoskinson

SURVEYING AND MAPPING NEWS ——— 145

BOOKS IN REVIEW ——— 151

MAP INFORMATION ——— 154

COMMENT AND DISCUSSION ——— 156

CONGRESS NEWS ——— 158

NEW MEMBERS ——— 160

SUSTAINING MEMBERS ——— 164

MEMBERSHIP ROSTER (As of December 31, 1951) ——— 167

SURVEYING AND MAPPING is published quarterly by the AMERICAN CONGRESS ON SURVEYING AND MAPPING, Box 470, Benjamin Franklin Station, Washington 4, D. C. Yearly subscriptions to non-members: U. S. $5.00; foreign $6.00. Single copies $1.50 plus postage.

Entered as second-class matter at the Post Office at Washington, D. C., November 13, 1944, under the Act of March 3, 1879. Additional entry as second-class matter at the Post Office at Lancaster, Pa.

Opinions or assertions expressed in articles in this Journal do not necessarily represent the official views of the CONGRESS.

The Role of Surveying and Mapping in Developing the Economy of Nations

By DR. GEORGE H. T. KIMBLE

DIRECTOR, AMERICAN GEOGRAPHICAL SOCIETY

NOBODY KNOWS who made the first survey, or drew the first map, but we have a pretty good idea of where he was and why he did it. The clues point, so the archeologists tell me, to an anonymous Sumerian civil engineer who, wearying of the annual obliteration of his landmarks in the flood waters of the Euphrates, decided to save himself a lot of trouble and his legal colleagues endless litigation by portraying the areas enclosed by these landmarks on a clay tablet. The people of Sumer liked the idea so much that they immediately went to war against their neighbors, the Akkadians, to provide themselves with personnel for the survey. As for the engineer, he was given a large office, a higher title, and soon forgotten. From such obscure parentage there came, in the fullness of time, the distinguished line of scientists that are met here today, and their many mighty mapping projects —their maps of oil fields for better prospecting, their maps of cotton, corn, and cattle for better taxation, their realty maps for better living, and their cemetery maps for better dying.

THE VALUE OF MAPS TO THE GEOGRAPHER

And what, you will ask, is the geographer's special interest in maps and surveys? To start with, the geographer maintains that it is no more possible to have geography without maps than it is to have biographies without men. And why? Because the geographer's primary concern is with the study of the areal differentiation of the human environment. He systematically observes, records, and describes the differences and similarities between the various habitations of man, and attempts to unravel their causes and weigh their consequences—and he cannot do any of this without maps. But you will probably say that a lot of other people are interested in the same sort of thing, including the sociologists, the anthropologists, and the economists, and, anyway, what is the use of the maps when you've drawn them? How can they help us in 1951?

I believe they can serve three valuable functions: Firstly, they can provide the geographer with an awareness of the true nature—and condition—of man's environment, for want of which Americans, by and large, are still treating their environment as if it were a bank to be burgled, rather than a trust to be husbanded. Of course, we all talk about soil erosion and resource depletion, but I seriously question whether many folks have even an approximate idea of its extent, unless they have seen it portrayed in maps. To put our "sins" on a map may not save us from their consequences, but at least it would bring home to us their enormity, and could well cause us to get to closer grips with the task of bringing the whole of the habitable earth into a state of enduring fruitfulness. And you will agree that the world never needed to bring forth fruit more abundantly than it does today, with its population increasing at approximately the rate of 55,000 every 24 hours. Planning, some people tell us, is the answer, and it must be admitted that the contemporary scene can provide some impressive illustrations of its accomplishments. But land planning, whether it is on a grand scale, like the Tennessee Valley Authority, or on a small scale, like the Ganaraska Watershed scheme of

Presented at Eleventh Annual Meeting, American Congress on Surveying and Mapping, Washington, D. C., June 18–20, 1951.

southern Ontario, costs millions of dollars, and sooner or later the taxpayers of the world are going to get very tired of paying for such projects. Would it not be simpler—and far cheaper—to spend money educating people in the fine art of environmental appreciation, whereby they would be able to weigh realistically the pros and cons of their traditional land economy, to discern cause and effect relationships, and to adjust that economy from time to time so that it provides them with all the physical ingredients of a good life? At least it is worth trying, especially in the "underdeveloped" areas of the world, such as intertropical Africa and Amazonia, where capital for major planning projects is never likely to be overabundant. We readily confess that the geographer is not the only man who could assist in such a campaign, but with his understanding of the "interconnectedness" of land and life, he would appear to have some of the necessary qualifications for the task.

Secondly, maps can help the geographer to comprehend the significance of differences between one environment and another. Environmental differences from place to place are real, and of incalculable economic and social importance, for "place" *influences*, even if it does not *determine*, human endeavor. Some people are more advantaged by their physical environment than others; others are only able to realize the advantages of that environment and surmount its disadvantages with greater effort or more time. Thus, it has taken Denmark a thousand years to bring its dairy farms to the productivity levels reached by the people of Wisconsin within the space of a generation. In the Dutch polders, the price of a crop is ceaseless vigilance against tide and storm, and the hard-won wisdom of many generations of engineers; whereas in many parts of the Paris Basin all that is needed to garner harvests of comparable magnitude is a wooden plow and a modest spring rainfall. The recognition of such differences (which words often conceal, but cartographic symbols have a habit of emphasizing) is by no means as general as the geographer could wish, but he deems it to be absolutely necessary if we are ever to understand the complexities of human economy and culture, and the uneven timing of developments that lie at the root of so many of our international difficulties. Indeed, many geographers would go further and say that, insofar as the characteristic group attitudes of human communities have a rational origin, the chances are that that rationality can be more readily disclosed by viewing those attitudes against the background of the communities in question than by any other line of approach. Without holding a brief for environmental determinism, let alone for Communism, it could be argued, for instance, that some part of Russia's traditional aggressiveness toward her neighbors in the West stems from the shortcomings of her climate, thanks to which few sections of her vast grain-growing lands experience more than two good harvests in a row. Throughout much of her steppe lands farmers annually face the hazard of too little rain, or too much sun. Eastward, northward, and southward of the steppes conditions worsen perceptibly—only westward do they improve.

Thirdly, maps can provide the geographer with the means of assessing realistically the adequacy, or inadequacy, of the environmental conditions of a given locality for the maintenance of a given standard of life. To him, a comprehensive spatial analysis of the material circumstances of a people's way of living (which includes such things as the distribution of soil types, climates, land use, mineral and power resources, means of transportation, and other public services) is, in his estimation, every bit as essential to the furtherance of that people's way of living as accurate maps of terrain, lines of communication, military installations, airfields, and ports are to the furtherance of an army campaign. With the help of such maps, he is often able to identify

areas of maladjusted economies and stress-points—social sores—where the well-being of an area, a state, or perhaps even a nation may be threatened, and to indicate the existence of localities offering greater possibilities for commercial enterprise and land settlement. The Canadian prairies have provided examples in plenty of such maladjustments and stress-points. To the early settler the prairies of southern Saskatchewan looked much the same as those of the Red River of southern Manitoba, and for a while they yielded so well that even the farmer saw no reason to doubt the evidence of his eyes. But by the mid-thirties his children knew differently for, whereas the Red River Valley was still yielding tolerably well even in the face of subnormal rainfalls, southern Saskatchewan was the scene of a mass emigration. Today the area is better understood: more ample data are available concerning its water table levels, its soil profiles, and its precipitation regimé, as a result of which much of the erstwhile derelict land is now being put to some productive use—as cattle pastures, irrigation farms, wood lots, and shelter belts. And there is even a chance that some of the reclaimed land will eventually sustain a denser rural population at a higher standard of living than it ever did in the "wheat-mining" era.

MAPS IN WARTIME AND IN PEACETIME

In wartime—need we say it?—no nation can afford not to think cartographically. For wars, while they may start in the world of the mind, are fought out in the world of the material—of jungle and marsh, wind and sand, where an unpredicted rainstorm can do more to turn the fortunes of a battle than a dozen impassioned speeches, and where the existence of a detailed map of an enemy-held beach can be a lot more comforting—and rewarding—to an invading army than the promise of a supporting naval bombardment. The price of erroneous geographical intelligence comes very high in war, as Napoleon discovered on his ill-fated Russian campaign, and, in recent times, as the Allies learned on more than one commando raid.

The need for good maps and good training in the handling and interpreting of maps, is, I submit, no less imperative in peacetime, for many of our problems in the inter-war years were aggravated by the fact (even if they did not actually stem from it) that we were grossly ignorant of the basic facts of world geography, or, to put it more bluntly, we didn't know our maps. Can it be denied, for example, that the Hungary of the Trianon Treaty was a territorial oddity, or that Budapest with its population of 1,500,000 people and large industrial establishments, was vastly too big for the much shrunken territory (essentially agricultural at that) which it served? To curtail a nation's power to wage war is one thing—and a very good thing—but to deny her the environmental basis of a workable economy (that is, agricultural as well as mineral resources, and commercial opportunities commensurate with her population's needs) is a very different thing—one not at all calculated to heighten the prospects of a durable peace. Unfortunately, there are not wanting signs that the lessons of 1919 to 1939 were ill-taught and that the high purposes of the authors of the Atlantic Charter have been forgotten. Thus, many of us are wondering how long India and Pakistan can exist apart in proud defiance of the many physical and economic ties that bind them. In few parts of the world are the geographical arguments for political fusion so clearly drawn as in the Indo-Gangetic Plain with its complete absence of natural barriers to communication, its unequal distribution of fertility, mineral resources, and rainfall, and its master streams demanding unified control if their power and irrigation potentialities are to be properly exploited.

It is equally open to question whether governments are wont to give proper weight to the geographical term in the equation of their domestic (and colonial)

economy. Take the British peanut scheme in Tanganyika for instance. This has already cost £36,000,000 and will cost many millions more before the British housewife derives an ounce of margarine from the undertaking. And why? Because the scheme was Utopian? poorly administered? inadequately staffed? No! The scheme could not have been more timely or manned by better trained and more enthusiastic people. The real trouble is that not enough was known about the climatic vagaries of the region, or the character of the terrain to be cultivated, the fertilizer requirements of the soil, or even the working habits of the natives. In other words, not enough was known of its essential geography. Had we been better supplied with maps of the region (maps of soil, rainfall, vegetation, as well as relief), things might have been rather different.

CURRENT CARTOGRAPHIC PROJECTS

The fact is that we must have more surveys and maps of every kind before we can even begin to examine our acutest economic and social problems—let alone solve them. Allow me to bring to your attention three or four cartographic projects in which I, personally, am very interested and which bear on such problems.

To some of us it has long seemed desirable to make a wider application of the skills which we acquire through our mapping and surveying activities. After all, when you come to think of it, there are very few facets of a man's life which cannot be mapped (or at least surveyed—as any woman will tell you). And what is more, most of the facets will be found to stand in significant correlation with other facets. Three years ago the American Geographical Society established a department of Medical Geography in the belief that the mapping of disease distributions and the study of their environmental correlatives throughout the world would provide new techniques, and perhaps new clues, for use in tackling one of the most compelling tasks of our time. As some of you may know, the Society has already produced maps showing the world distribution of poliomyelitis and cholera. Now it is working on a map of malaria vectors, and hopes to complete an atlas of some 25 diseases within the span of the next 3 years. Judging from the interest being taken in the project by medical authorities in this and other countries, we are encouraged to believe that, by our endeavors, we are furthering public appreciation of the geographical pattern of disease, even if we cannot yet claim to be hastening the day of its control.

The American Geographical Society must also plead guilty to a cartographic ambition of a rather different sort. It would like nothing more than to see a national atlas produced that would be worthy of the country and commensurate with the needs and opportunities of the hour. Of the lack of such an atlas I do not have to tell you. Good as many of the commercial atlases are, there is not one (nor, indeed, has there ever been one) of which we can truthfully say: "This, ladies and gentlemen, depicts the land, life, and livelihood of America, the basis of its strength and weakness, its wealth and its poverty—the anatomy of its power at the mid-century—in very truth, the state of the Union!" And we are self-opinionated enough to believe that, with the help of the Association of American Geographers and Federal agencies, we can do the job, for there are few institutions that, throughout their history, have been more closely associated with map making, or better served with documentary resources and manual skills. Availing ourselves of the A. A. G.'s report on the subject, and equipped with a very passable facsimile of the atlas that we hope to produce, we look forward to undertaking the preliminary compilation in the near future.

In the international field even bigger mapping projects are afoot. Take, for instance, the International Geographical Union's proposal to carry out a world

land-use survey. Of course, there is nothing very novel about the idea of land-use surveys. Geographers have been undertaking such surveys for many years. In the thirties, British geographers under Dr. L. Dudley Stamp produced a field-by-field survey at a scale of 6 inches to the mile, and in doing so, earned the everlasting gratitude of the British government, for one of the first things the U. K. Department of Agriculture sought to obtain at the outbreak of World War II was information concerning the existing use of food-raising land, and the possibilities of extending its area and augmenting its yield. With the help of this survey, the British government was ultimately able to increase the acreage of cultivated land by 60 percent and the output of foodstuffs by 100 percent. Together with the land-classification maps compiled about the same time, this same survey was later used by the Ministry of Town and Country Planning to indicate areas suitable for the expansion of industry, and new housing and town sites in such a way as to cause very little disturbance to the existing economy.

Many geographers now believe that the time has come to tackle a world survey, if only to provide us with something better than the nebulous thinking and naive generalizations of those who periodically issue pontifical bulls concerning the capacity of the earth to feed and clothe itself, and write best sellers in support of their claims. The fact is that nobody knows at present how the totality of the world's land is used (except in the vaguest kind of way), let alone how well or badly it is used in relation to its intrinsic possibilities—which means that nobody can possibly make more than the roughest approximation of the food-raising potential of the lands already in use, to say nothing of those that are as yet undeveloped. To some of us at least, it seems nothing short of stark foolishness to spend billions of good American dollars in the development of so-called backward areas until we know *what* there is to be developed and *where* it is. There is also the further important consideration that, unless the present use of such lands is more fully known and understood, development schemes may cut across the existing economic structure of those lands in such a way as to cause more harm than good. For these and other reasons the International Geographical Union, of which I have the honor to be Secretary, is now girding itself for the not inconsiderable task of mapping the land use of the world on the scale of 1 : 1,000,000.

Less impressive in scale but equally pertinent, we believe, is the UNESCO scheme (with which I.G.U. is actively cooperating) for a comprehensive mapping of the arid and subarid zones of the earth. Among other significant variables that we hope to plot in the course of time are wind velocities (which take on a special interest in terrain bedevilled by sand and low water tables—the wind pump is still the basis of many an irrigated economy and in no danger of being superseded in lands where fuels are scarce), ground water levels, surface cover, precipitation-evaporation indices, moisture requirements of specific crops in given rainfall zones, and alkalinity. Work has already begun on homo-climatic maps of the desert regions of the earth, under the direction of Dr. Peveril Meigs, Chairman of the I. G. U. Committee on the Arid Zone.

Please do not mistake me though. I am far from saying that all we need to give us better times and more stable economies is better maps or more surveys. What we need even more, I submit, is better map users—better men in fact. The best maps in the world and the most ambitious surveys may help us to diagnose the troubles of humanity, but it will take all the sympathy, understanding, and unselfishness of all the good men in all the parties to solve them.

Resurveys of Original Grants in North Carolina and Other States of the Original Colonies

By GRADY S. HARRELL, R. L. S.

CHAIRMAN, COMMITTEE OF LAND SURVEYORS OF THE NATIONAL COUNCIL OF STATE BOARDS OF ENGINEERING EXAMINERS

WHEN MAKING RESURVEYS of original grants in North Carolina and other States of the original colonies, the surveyor should remember that all those surveys were made with a Jacob's-staff compass and a magnetic needle, and also that the bearings shown on the original survey will not be the same as of today. Therefore, the surveyor can usually save himself a great deal of unnecessary work and also make a reputation for himself as a surveyor who knows what he is doing by first going to the courthouse of the county in which the land is located and checking all the records pertaining to the land he plans to survey. If the tract that he is going to survey goes back to the original grant, then he should go to the land-grant office, which is usually in the Secretary of State's office, and secure a photostat of the original surveyor's plat. Mistakes are often made in copying deeds in the Register of Deed's office. The surveyor will frequently find a course and distance left out of the deed as recorded, or else a call is written northeast when it is southeast on the ground. When the surveyor is able to secure a photostat of the original surveyor's plat from the Secretary of State's office, he can then check this plat with the grant as it is recorded in the county in which the land is located. If there is any difference, he can be sure that the mistake was made in the local Register of Deed's office; and he should then proceed to make his survey in accordance with the original surveyor's plat.

Another good reason for tracing the records back to the original deed or grant is that, in conveying land, it is the usual practice to copy the bearings from the old deed and make no reference to the date of these bearings. If a surveyor uses a deed dated 1890 and tries to survey the lines in accordance with bearings of that date, when perhaps they had been copied from a survey made in 1790 or earlier, he is certain to miss the corners that were established by the first surveyor. But if the surveyor has a complete history of the land he is trying to survey, he can calculate the change in bearings from the original survey to the present date; and, by making the proper correction for variation, he should come very close to the original corner.

It also pays the surveyor to check the deeds of the adjoining property owners before beginning his survey. This can also be done in the courthouse. The surveyor will often find from the records that either the property he is to survey overlaps the adjoining property or the deed for the adjoining property overlaps the property he is to survey.

He may also find that there are small vacant pieces of land that no deed covers. By learning this before he starts field work the surveyor is in a far better position to look after the interests of the person for whom he is working than he would be if he were to try to make his survey from the information shown in the deed alone.

Most people employing a surveyor would prefer to pay for the time spent in looking through the old records rather than to pay several men for cutting bushes on lines that are incorrect and which would have to be resurveyed when the error is found. Frequently, also, the

Presented at the Eleventh Annual Meeting, American Congress on Surveying and Mapping, Washington, D. C., June 18–20, 1951.

incorrect lines will encroach on the property of adjoining owners and cause a misunderstanding between friends which could have been avoided by the surveyor's taking time to secure all the information available before beginning the survey on the ground.

The earliest grants in North Carolina were evidently laid out with differences in the lengths of chain and the sizes of acre. There is a grant from the King of England to William Wilkerson, recorded in Raleigh, North Carolina, dated March 14, 1694, that calls for 500 acres English measure.

The following is copied from an old book on surveying by W. M. Gillespie, LLD., C. E., dated 1857 and said to be the fifth edition:

"In different parts of England, the acre varies greatly. The Statute acre, as in the United States, contains 160 square perches of 16½ feet, or 43,560 square feet. The acre of Devonshire and Somersetshire contains 160 perches of 15 feet, or 36,000 square feet. The acre of Cornwall is 160 perches of 18 feet, or 51,840 square feet. The acre of Lancashire is 160 perches of 21 feet, or 70,560 square feet. The acre of Cheshire and Staffordshire is 160 perches of 24 feet, or 92,160 square feet. The acre of Wiltshire is 120 perches of 16½ feet, or 32,670 square feet. The acre of Scotland consists of 10 square chains, each of 74 feet, and therefore contains 54,760 square feet. The acre in Ireland is the same as the Lancashire. The chain is 84 feet long.

"The old French land-measures were the 'Arpent of Paris,' containing 36,800 square feet, and the 'Arpent of Waters and Woods,' containing 55,000 square feet."

The Twelfth Annual Meeting

The Twelfth Annual Meeting of the American Congress on Surveying and Mapping is to be held on June 11, 12, and 13, 1952, at the Shoreham Hotel, Washington, D. C.

An interesting and informative program has been planned centered around the recognized leaders in surveying and mapping. The largest exhibit ever displayed at an annual meeting of the Congress has been arranged. Prominent domestic and foreign manufacturers will display surveying, mapping, and other scientific instrumental equipment and modern materials.

Each of the six technical divisions will have several papers dealing with various aspects of their particular field of surveying and mapping, and most divisions will feature a panel discussion in their program. Included in the panel discussions are such topics as: "Map Appreciation and Use," "Specifications for One-minute Transits," "Advantages of Local Professional Surveyors Organizations," "Selection of Contour Intervals," and "Surveying Techniques—Tricks of the Profession."

Several social functions have also been planned, including, specifically for the ladies, a luncheon and a conducted tour of the National Gallery of Art, and, for the general membership, a cocktail hour and "get-together" on the first day of the meeting and the annual banquet and dance on the last day.

Winter Control Traverse Surveys in Canada

By J. B. O'NEILL

TOPOGRAPHICAL SURVEY, DEPARTMENT OF MINES AND TECHNICAL SURVEYS, OTTAWA, CANADA

THIS PAPER deals principally with the organization, method of procedure, and transportation of a survey party in the field during the winter season and is not intended to be of a technical nature. In a gathering of men who have had much experience in the theory and practice of surveying, there is no need to describe the methods of running a stadia traverse.

Surveying and land subdivision have been carried out during winter months more or less continually throughout the history of Canada, but the execution of control for topographical mapping by winter survey is rather new.

TRANSPORTATION

The foremost problem encountered in mapping the northern reaches of the Dominion is one of transportation. The surveyor, on leaving roads and railheads at the beginning of the field season, finds himself embarking on an exploratory excursion, utilizing every available type of transportation according to the particular terrain over which he must travel. Horses, mules, canoes, tractors, conventional aircraft, helicopters, and, unfortunately, back-packing may be employed in a single season by the party chief. However versatile these methods may appear, areas still exist over which their use is not practical for extending ground control. The huge muskegs of the Northwest Territories are a good example of such forbidding areas. Therefore, it became necessary for the planning staff to adopt another method of overcoming these obstacles. The decision to embark on a winter field program was conceived from necessity, supplemented by the desire to broaden the scope of operations in conformity with the current heavy demand for mapping.

Among the areas included in the 1949 field program was one in northern British Columbia. The western part of this area on the eastern slope of the Rocky Mountain range is suitable for a combination of terrestrial and aerial photogrammetry. The area extends eastward, however, to the flat, wooded muskeg country of the drainage basin of the Liard and Nelson Rivers, a region practically impassable to pack horses. Streams in the area are not suitable for canoe travel but, when frozen, are excellent highways for dog teams. Therefore, it appeared that winter survey was the most practical and economical method of attacking the project.

The stadia traverse method of surveying was chosen because of existing conditions and the type of control desired. The problems of transportation, supply, and maintenance in the field were given careful consideration: the varied types of terrain in the area allowed only one possible solution—dog teams and an aircraft supply unit. Other means of transportation, including the horse and bulldozer, were eliminated because of the existence in the area of large muskegs, which are often covered with a blanket of snow before freezing solid, plus deep canyons, steep inclines, and fast-moving open water.

In order to estimate the amount of work possible in one winter's season, it was necessary to determine the safest time to cross the ice of the various rivers, streams, and lakes. January 1 and April 10 were decided upon as the optimum limiting dates for field work. An estimation of the number of miles the camp unit could travel a day under varying conditions was supplied by local trappers in the district.

Presented at the Eleventh Annual Meeting, American Congress on Surveying and Mapping, Washington, D. C., June 18–20, 1951.

ORGANIZATION

The decision to maintain the party in the field by contract was a departure from the usual procedure; but, in this particular case, it was a very wise decision, for the party chief, up to that time, had very limited experience in winter travel. The contractor, a local resident of many years' experience, assembled his crew of four and his field equipment and made a reconnaissance flight over the first part of the route. His crew was established along the following lines: the contractor, who remained at base camp in charge of supplies, communications, and air transport; the field supervisor, who was in charge of the camp crew and drove one dog team; two dog drivers, who also acted as camp assistants; and lastly, the cook, who, as a matter of interest, was an American citizen and a native of Halliday, N. Dak. His culinary skill must be accepted universally, for he held the enviable position of a G.I. chef in World War II. He mushed a dog team with equal skill.

EQUIPMENT

Equipment consisted of four dog teams, the usual camp equipment, and a Stinson "Voyager" aircraft capable of carrying a 600-pound pay-load.

The dogs, four teams of five dogs each plus two spares, were Indian huskies, much heavier dogs than the Eskimo huskies and bred especially for heavy work. These dogs weigh about 110 pounds each and are capable of pulling loads of 150 pounds per dog over rough country in deep snow without broken trails; they can pull considerably more where trails exist.

Camp equipment consisted of two tents, two folding stoves, a folding roll-top table, and cooking utensils. Food supplies were of the general bush type. Canned goods were omitted because of weight restrictions. Dehydrated and dried foods, plus the old reliable beans, bacon, and sour-dough bannock, though probably not an appealing menu by some standards, formed the bulk of the fare and proved very substantial. Various types of vitamin tablets were taken to supplement any appreciable deficiency in the diet.

Personal equipment was kept to minimum weight and bulk because of restrictions necessitated by the amount of dog food carried between supply dates. At his daily feeding each dog consumes 2 pounds of mixed dog food plus ½ pound of beef tallow—on this particular survey, a total of 55 pounds per day. Four days' reserve of dog food and supplies was kept on hand to meet any emergency. Total weights carried on the dog toboggans ranged from 3,000 pounds on each supply date to 1,800 pounds on the day before the supply plane returned.

Prior to departure from Ottawa of the three field officers, instruments were turned over to the National Research Council for winterizing. The Keuffel & Esser 1-minute reading transit, binoculars, etc., were tested under simulated winter conditions at temperatures of −40° F. Two P.N. 1 B Marconi two-way radio sets were checked and issued for communications. Personal clothing was mainly of the army type, previously tested in northern climates.

TRAIL LIFE

On January 2 the survey field party arrived by plane at Fort Nelson, B. C., where the camp crew of four men and the four dog teams were waiting, pre-

pared to move at once. At first light on January 3 the complete party started on its 3-month trip.

The daily schedule in the field was along the following lines: breakfast at 6:00 a.m. and beds rolled and the survey party on the line ½ hour before daylight. This may seem unusual, but it was not without reason. In latitudes of 60° the hours of daylight in January range from 5¾ to 7½. Therefore, in order to take advantage of every minute of daylight, this half-hour was used to boil tea and have a light lunch. Work was then continued through the day until darkness made survey operations impossible, when tea was again made before returning to camp.

The camp crew in the meantime had broken camp, loaded, and moved, usually passing the survey party in mid-morning. The crew usually arrived shortly after noon at the camp site selected on the aerial photograph the previous evening. After unharnessing the dogs and unpacking—the dogs, of course, were the first consideration—beds of spruce boughs were laid out in a small snow dugout near the trees to which the dogs were tied. After this was done, the crew split into two units, two men leaving to break trail for the next move, and two others setting up camp. Usually trail was broken about half the distance the survey party expected to cover the following day. This eliminated any trail breaking by the survey crew and gave it a good frozen trail to start on in the morning.

As to setting up camp, tents were necessary about 90 percent of the time, for trappers' cabins were few and far between. The area for the tents was tramped down with snowshoes and both tents were erected on the same ridgepole, door to door and about 3 feet apart. The floor of each tent was covered with a layer of green boughs, the side walls were banked with snow, and the stoves were set on their metal frames.

Water was usually obtained by cutting a hole in the ice about 2½ feet deep and shooting holes with a rifle through the remaining ice to the water, which would seep up through the holes. To keep the water hole from freezing solid it was filled with snow, which was easily cut out in the morning. On only two occasions was snow melted for water.

The survey party, on arrival at camp after dark, would find the tents warm, beds laid out, lamps lighted, and dinner prepared. This system of administration was ideal and worked to perfection.

Bedrolls were of the Arctic type, down-filled, with a windproof covering which had a zipper up the side, allowing only a small breathing space at the head. The canvas camp cot is not a practical item for winter use because of drafts beneath it. The bedroll was placed on the tent floor, settling very comfortably into the green boughs under which was the frost-resistant snow. When short fly trips are made and it is necessary to sleep outdoors, the bedroll is buried in the snow to within a few inches of the top.

The first 4 days in the bush tended to be slightly uncomfortable, for it takes about that number of days for a person to acclimatize himself to a state of working efficiency in temperatures from −50° to −60° F. The unpleasantness is most noticeable at 6:00 a.m., when sleeping bags are abandoned for the day. After the first few days, the weather ceases to be an obvious topic of conversation or concern.

THE SURVEY

Various types of terrain were encountered along the survey route. At the outset, for a distance of 30 miles, the party followed the Toad River, a typical mountain stream that was almost continually wind-swept. The winds bared the ice, which made easy travelling for the dogs, but the weather was extremely uncomfortable. It was found that working at 20° F. below zero in a wind was more disagreeable than working in a calm at 60° F. below. However, this condition was short-lived, for after a few days the sur-

vey swung overland to reach the headwaters of the Dunedin River.

This river, draining a high plateau, winds through heavily wooded terrain to within 40 miles of its mouth. Here, in a series of waterfalls from 10 to 40 feet high, it suddenly drops nearly 400 feet into a deep, narrow gorge, absolutely unnavigable in summer and approached with some misgivings in winter. A reconnaissance flight over this part of the river revealed open water below most of the falls. The only alternative to this route would have been to cut a line through the bush, a slow and difficult process. The contractor, being an adventurous soul as well as a confident one, therefore determined to attempt the river route, a determination heightened by a strong desire to be the first man to traverse successfully the tortuous course of the Dunedin in its entirety. Being novices, we were inclined to follow. That he accomplished the feat I can warrant. Whether or not he had a predecessor is a debatable point; but, as far as I'm concerned, he may carry the honor and rest on his laurels. I am not a competitor in that field.

The higher falls were overcome by the use of ropes. The first man lowered over the edge cut stairs in the ice with an axe as he descended and on reaching the base secured the rope. The remainder of the party, less two, followed. Next came the dogs, lowered one at a time, and finally the toboggans. That the open water below was not an obstacle was due completely to good luck rather than good management. For 10 days previous to reaching this sector we had continual cold weather with the temperature around 50° below zero. Because of this the water in the river dropped considerably and below the waterfalls a shelf of ice remained frozen to the canyon walls, somewhat narrow in places but sufficiently wide to accommodate a man. The dogs were led singly along this shelf, for the toboggans had been unloaded and the equipment back-packed.

The last few miles on the Dunedin River were travelled without any incident of note. The mouth of the river marked the end of the first phase of the work, a distance of 183 miles traversed in a total of 44 days.

The first sight of Nelson Forks, a village boasting a Hudson Bay store and seven families of Beaver Indians, can best be described in the words of Keats, "A thing of beauty is a joy forever," to which in this case I might add "regardless of the odor."

The really difficult travelling now lay behind us. The extension of the traverse to Fort Liard in the Northwest Territories and on to the final tie at Fort Nelson was fairly routine. Rivers and streams were followed for the most part, entailing nothing more exciting than trail breaking and contending with drifting conditions and overflow. The latter often becomes a serious problem, however, both for dog travel and the landing of aircraft. This condition arises when the weight of snow forces the ice downward

and the water seeps up through the cracks and around the edges. Due to the insulating properties of snow, the water doesn't freeze, but often lies under the snow as much as a foot in depth. When this condition exists, it is impossible to use the river or the lake as a landing strip. Overflow can also be a source of danger for both man and dog. Once a dog breaks through to the water, large balls of ice freeze on his feet. It is not unusual to see all the dogs lying down by the side of the trail chewing the ice from their feet, and being ably assisted by the dog driver using his molars and bicuspids in much the same manner—probably not a very hygienic method, but certainly a practical one, and speed is essential at such a time. Small moosehide moccasins are sometimes used as safeguards should overflow be encountered. These are not completely waterproof, but they do keep the dogs' feet warm and free from ice.

On several occasions it was necessary to depart from the watercourses and proceed overland. In that event the supply plane was used to scout the easiest or most open routes. Although line cutting was necessary, it was a comparatively easy task because there were no leaves on the deciduous trees, the smaller underbrush was covered with snow, and, due to the excessive frost in the wood, small trees were snapped off with a very light blow of the axe.

When the survey was completed on March 31, a total of 507 miles had been covered in 86 days, of which 79 were working days. The temperature during this period ranged from 15° F. above to 62.5° F. below zero. The average temperature for the whole time was 27° F. below zero.

The dogs had not caused a moment's delay and were in excellent working shape with the exception of the odd scars sustained in the pursuit of their favorite pastime—fighting. However, most northern dogs are extremely friendly once they know each member of the crew. A stranger in camp is always well announced and, strangely enough, Indians are not welcomed by the canine members of the white man's party. Inversely Indian dogs have a distinct objection to white men—probably a matter of fragrance.

PARTY HEALTH AND MORALE

The health of the party was very good; common colds were nonexistent until the party had returned to civilization. One man suffered a badly frozen toe, but this was carefully watched and nothing serious resulted. Before proceeding north for an extended winter period, one is well advised to consult a dentist. Extreme cold weather has a very definite and painful effect on cavities, and fillings have a tendency to fall out.

Clothing is always an important item in winter work. Experiments with new types of materials and fabrics are being constantly carried out. Army-type parkas and windproof clothing, thoroughly tested on the joint American-Canadian army exercise, Sweetbriar, are probably

the best winter clothing available. This outer covering, plus good woolen undergarments, ensures every possible comfort to the wearer under normal circumstances. Native-made moosehide moccasins are the best footwear for snowshoeing. Cleanliness and dryness of clothing are of paramount importance. The army sunglasses were far superior to any other type used by us as a precaution against snow-blindness.

Personal hygiene is a bit difficult. We were fortunate on this project in that we camped several times near hot sulphur springs. Ordinarily, the arrival at a trapper's cabin took on an air of the proverbial Saturday night in the country, with each man taking his turn at the tub. In March, when on occasion the sun radiated an appreciable amount of heat, a snowbath was enjoyed. This, however, was a matter of ruggedness rather than cleanliness.

Work, of course, is always the "order of the day," but since recreation is a matter of morale, particularly in such an isolated environment, it cannot be ignored. A small radio is an invaluable item during the long nights, and reception is usually good in the North. The occasional visits with local trappers and Indians help to break the monotony. Aurora borealis at times puts on a most spectacular show to the accompaniment of thundering cracks, often performing in technicolor. Fishing through the ice for 40-pound pike is an appetizing pastime as well as good sport if one is enthused to the state of ambition required for cutting through several feet of ice. Hunting is restricted to comply with the provincial game laws; however, in cases of emergency, permission for the replenishment of meat supplies is readily granted to a survey party. Moose and caribou are plentiful and easily tracked in the deep snow. There is no restriction on wolf hunting. These creatures travel in packs and kill purely for lust, destroying untold numbers of every type of animal in the country. Fur-bearing animals such as mink, marten, lynx, squirrel, and wolverine are the property of the trapper or Indian to whom trapping rights have been allotted.

Contrary to expectations, continued cold weather did not have a demoralizing effect on the party. It was the unanimous opinion of all members on the survey that working conditions and general camp life in winter are more pleasant than those usually experienced on summer projects. This is easily understood if one has spent a summer season in the north, combating mosquitoes, black flies, and moose flies.

SURVEY OPERATIONS

Very little of the actual survey itself has been mentioned. The work was of a routine character, a matter of carrying azimuth and vertical angles and double-checking stadia distances. Firm setups were made on snow tramped down by the front rodman before establishing the station. The air is usually clear, but on some sunny days short shots are necessary because of considerable radiation. Observations for azimuth were restricted to stars, for the sun at this latitude is too low in winter for an accurate determination.

CONCLUSIONS

The winterized instruments proved to be very efficient even in $-60°$ F. weather. Several precautionary measures had to be taken by the instrumentman; breathing on the lens not only created fog, but the moisture would immediately freeze. It was not only unwise, but often painful to allow one's eyelashes to come in contact with the metal part of the telescope, nor was a beard an asset when frozen to the plates. As a matter of fact, a beard is of no material advantage in any phase of winter work.

The conclusion of this survey marked more than the successful completion of one particular project in very difficult country; it also confirmed the practicability of winter surveys of this type. Accepting winter conditions as a means

towards an end rather than attempting to simulate summer conditions in a country not easily conquered appears to be a sound decision. To the Indian or Eskimo the coming of the fall snow is an event of major importance. His social and economic life undergoes a transformation. From an existence of isolation, he once more becomes a member of the great community of the North, within easy reach of his fellow man and means of livelihood, simply because Providence has provided the means of travel.

Mechanization has been the very foundation of recent developments in the North, but in basic mapping the primary object is the complete coverage of all the country in the hope that, with adequate maps, development of the resources will follow. In order that this coverage may be attained, not only the accuracy of the survey, but also the method of travel, speed, and maneuverability, become the main criteria. In this the machine has greatly assisted, but has not as yet replaced the dog team and snowshoe.

❦ ❦ ❦

TVA Bulletin on Surveying and Mapping

Tennessee Valley Authority has published Technical Report No. 23, *Surveying, Mapping and Related Engineering,* which covers TVA's experience in this specialized engineering field.

Among the more important phases of this branch of engineering discussed in the report are: control and adjustment of surveys, planimetric and topographic surveying and mapping, resorvoir surveying and mapping, land aequisition engineering, utility relocations, grave removal operations, and military mapping. A chapter on miscellaneous surveying and mapping covers aggregate source surveys and investigations, mine and mineral surveys, archeologieal exploration surveying and mapping, recreational development surveys and maps, damage claim investigations and surveys, local flood protection surveys, shore line improvement for malaria control, and malaria control map preparation.

Most of the methods discussed in the report have been time-tested, but many of them were used, perhaps, for the first time in the particular combination described. On TVA's first construction project—Norris Dam—an innovation in surveying and mapping practices was instituted. In order to speed up the cadastral surveys for the purchase of reservoir land, aerial photographs enlarged to a predetermined scale were used as planetable sheets. Both time and money were saved by this procedure, although it has now generally been replaced by improved applications of photogrammetry. The preparation of five-color topographic quadrangle maps from aerial photographs is discussed and illustrated by color plates in the report.

The appendixes cover map reproduction; typical field instructions and survey control data bulletin; typical survey computation forms; typical contract for aerial photography; typical legal instruments used in utility relocations; and typical documents, forms, and related material used for grave removal operations.

Orders for *Surveying, Mapping and Related Engineering* may be sent to the TVA Treasurer's Office, Knoxville, Tennessee. It contains 416 pages including 8 color plates and 132 illustrations. Price $2.25.

❦ ❦ ❦

SURVEYING IS ENGINEERING

THE American Congress on Surveying and Mapping recently received a boost in its continued efforts to secure recognition of the fact that those engaged in professional surveying and mapping work in the Federal service are engineers. The American Society of Civil Engineers, at a meeting of its Board of Direction on March 3 and 4, 1952, in New Orleans, passed a resolution to the effect that the planning, execution, and direction of professional surveying activities constitute professional engineering and that public interests will be best served when such work is directed and performed, as much as possible, by qualified professional engineers. It ordered that the resolution be transmitted to the U. S. Civil Service Commission.

Using Available Control in Teaching Higher Surveying and Photogrammetry

By CARL A. EGNER

PROFESSOR OF CIVIL ENGINEERING, PURDUE UNIVERSITY

AS AN AMATEUR TEACHER, who returned to his Alma Mater after 33 years in the U. S. Coast and Geodetic Survey, it should be evident that there were adjustments to be made in my trend of thought to fit into an academic environment—adjustments such as: (1) conflicts between the theoretical and the practical, (2) difficulty in the establishment of some inherent incentive in students who had little or no previous experience in precise work, and (3) helping the students realize that the higher branches of surveying are not for specialists only, but are important for all surveyors.

Regarding (1), we believe that college courses, in general, have been too theoretical and that greater stress should be placed on procedures developed by long practical experience in the field by those organizations devoted to that activity. Regarding (2), it is believed that this difficulty can be partly avoided if the students are shown, by a practical example, how these procedures are translated into an actual map in which they themselves have a definite part in the making. Regarding (3), demonstrations are the only answer, in showing that rapidity of operations and use of the better types of instruments go together in producing economy and greater output, while at the same time maintaining a higher standard of accuracy.

After many years of constant association with control, and particularly with triangulation in its many forms, one takes that control for granted—a sort of something not necessary to argue about. As is well known, the program of the U. S. Coast and Geodetic Survey in establishing its nation-wide network of basic control is to provide a framework to which local agencies can tie their individual projects, and to give the local surveyors and engineers starting points from which they can orient themselves and proceed in their own work. As this program has expanded in recent years we find the original framework being rapidly supplemented by breakdown stations intended for this local use.

Supplementing this control framework are the State Coordinate Systems, devised by the U. S. Coast and Geodetic Survey, by which the geodetic control can be converted into rectangular coordinates for the use of those who are not adept in geodetic methods of computation. Already 25 States have legalized the use of these systems designed for the peculiar needs of each, based on either the Lambert or Transverse Mercator projection. We were glad to see Indiana become the 25th State in February 1951 when, after two previous unsuccessful attempts, the bill passed both houses of the legislature by votes of 84 to 1, and 29 to 11, and was thereupon signed by the Governor. We are, incidentally, curious as to why 11 presumably up-and-coming State senators voted against this forward-looking legislation.

Regarding our State of Indiana, I believe there is no material difference in our situation, controlwise, from that in other States. Our triangulation network is well along toward completion (with some obvious "holidays" here and there) as a result of considerable U. S. Coast and Geodetic Survey activity in the past several years. This has, of course, been brought about largely by the expanded program of the U. S. Geological Survey for topographic quadrangle maps in In-

Presented at the Eleventh Annual Meeting, American Congress on Surveying and Mapping, Washington, D. C., June 18–20, 1951.

diana. The two bureaus are working hand in hand toward a common end. The same is true of vertical control. Naturally, we in the State wish to see all of this completed and put to more widespread use.

Our teaching program at Purdue aims toward:

(1) Teaching the relationship of the federal programs to the problems of the local surveyor.

(2) Instilling a conception of adequate control as a basis for all surveying.

(3) Demonstrating, with field practice, the methods of geodetic operations, with stress laid on the principle that accuracy and economy are not incompatible.

(4) Using our State university as a medium for disseminating State control information.

(5) Active propaganda in the furtherance of the State Coordinate System.

For my own immediate part, in my Higher Surveying and Photogrammetry courses, I have frankly gone "Coast Survey." I use U. S. Coast and Geodetic Survey manuals as my textbooks, with considerable reference to other works where they apply in specific instances. We use, insofar as possible, U. S. Coast and Geodetic Survey types of instruments and procedures. Realizing that a majority of our students will remain in Indiana after graduation, this seems to be one way of sowing the seed of the use and understanding of the control network as a part of a long-range educational program.

Geodesy may be, and generally is, a dry subject in any curriculum. Photogrammetry, on the other hand, profits from an aura of glamour which a little intense application does not entirely dispel. To solve this, I link the two courses together in an attempt to show that photogrammetry is only as good as its basic control. I handle it much as I would were I still in the U. S. Coast and Geodetic Survey and were told to produce a map of the Purdue campus by photogrammetric means, using students as members of my field party.

Maybe we are quite lucky in our control set-up in the environs of Purdue. We had a station of the old 1934 CWA traverse system on the campus; another in Lafayette across the river; and a few previously located intersection stations—stacks, tanks, spires, etc. About the time I started my Higher Surveying course we were fortunate in having our locality in the path of a major triangulation arc south-bound from the Michigan boundary. I struck while the iron was hot, so to speak, and with Washington approval (thanks to Captain Hemple) induced Commander Bolstad to locate two stations on the campus where they would do the most good. In the regular program of this party several other objects were located by intersection, and in no time we had our campus covered by a geodetic control network with all the representative elements, though perhaps somewhat in miniature. This gave us a sample of practical geodesy which we could show our students without going off the campus.

We had, meanwhile, air-photo coverage in the form of Department of Agriculture 1/20,000 scale photographs, taken in 1939, which gave us a made-to-order problem for our photogrammetry. In addition, we now have large-scale aerial photographs, from low altitude flights in 1948 for mosaic purposes, which, although poor for photogrammetry, are excellent for large-scale detail.

The control, thus made available, was almost sufficient to control the photographs. Where it was not, our Higher Surveying students, who also took photogrammetry in most cases, provided more stations using various methods—by adding a triangle to the existing scheme, by observing and computing three-point fixes, by measuring a first-order base between a station and its azimuth mark placed conveniently for that operation, etc. We now have 29 stations, of various classes of accuracy, on the Purdue reservation and environs which are enabling us to make a planimetric map which we hope will "stand up." Each semester we add an additional control station or two

and add a new section to our detailed map. Elementary contouring follows in regular order as we are able to do that operation.

This, of course, makes sense to others only if it points a way. I realize that we have been fortunate in having an adequate amount of control upon which to build; but I believe that few university reservations are so poorly situated as to have no control already established. I am reasonably confident, also, that the U. S. Coast and Geodetic Survey, in line with its established policy, will help by adding a station or line, as it did in our case, if it is at all feasible in the regular course of its program. This leaves the matter lacking only a modicum of ingenuity on the part of the instructor.

I think that a measure of incentive, perhaps otherwise lacking, can be instilled in this way into the students by changing a dry, textbook course into one of definite accomplishment. It will also, I believe, keep the instructor reasonably young and "on the ball."

Fifth Texas Surveyors Short Course

The Fifth Texas Surveyors Short Course, sponsored jointly by the Texas General Land Office, Texas Surveyors Association, the University of Texas, Texas A. & M. College, and the Board of Examiners of Land Surveyors, was held in Austin on February 7, 8, and 9, 1952. One hundred ninety-seven surveyors registered for the course.

John Baker, Licensed State Land Surveyor and member of the Examining Board, explained the requirements for applicants seeking examination for license.

"The Vanishing Footsteps of the Original Surveyor" was discussed by Clayton Orn, attorney for Ohio Oil Company.

Jesse P. Luton, Assistant Attorney General, spoke on "Recent Decisions on Land Cases."

"A Search of the Records of the General Land Office in Austin" was the topic of a paper by John T. Simmons, Jr., attorney in charge of the Old Title Division. He explained the various types of land units: Spanish, Mexican, and Texas Colonial Grants, four classes of Headright surveys, School Scrip, Railroad, Bounty, Donation, etc.

T. A. Orr, Associate Professor of Civil Engineering, A. & M. College, who spoke on an "Outline of Full College Course in Texas Land Surveying," asked the surveyors to write him what we should teach our students about Texas Land Surveying. Forrest Daniell of the Texas Company announced the plans of ACSM to prepare an index for a proposed textbook for land surveyors and announced the Annual Meeting of the Texas Section, ACSM, on February 21.

The draft for the "Proposed Changes in our License Law" was read by J. Stuart Boyles, veteran land surveyor.

"Changes in Outline and Topography and Their Recordings in Civil Engineering by Photography" was the topic of a talk by Paul Weaver of the Gulf Oil Corporation. He advocated the extension of the triangulation system, the use of the coordinate system, and the preservation of ground and aerial survey maps for the use of future generations.

A number of additional speakers addressed the group on a variety of subjects and each attendant was presented with various complimentary pamphlets and brochures.

The Bureau of Reclamation recently issued the following project maps: Grand Valley, Colo.; Humboldt, Nev.; Frenchman-Cambridge Division, Missouri River Basin, Nebr.; Lower Marias Unit, Lower Marias Division, Missouri River Basin, Mont.; Yellowstone Division, Missouri River Basin, Mont.; and Uncompahgre, Colo.

The maps are available in color in both the 10½- by 17-inch and the 21- by 34-inch size. Requests should be sent to the nearest regional director of the Bureau of Reclamation. Single copies are available free of charge to those who need them in connection with their work or studies.—*Reclamation Era*, November 1951.

Interpretive Cartography

By WILLIAM DAVIES

U. S. GEOLOGICAL SURVEY

THE DEVELOPMENT in recent years of a "map conscious" public in the United States has given the cartographer a chance to broaden his field to include a number of types of maps for which there was formerly little or no demand. Included in these new types are maps that do not attempt merely to portray facts concerning natural or cultural objects but that go a step further and interpret these features in terms that are readily understood by the nontechnical or untrained map reader. The subjects included in such maps cover a wide range —from topography, geology, and other natural features to economics, sociology, and history.

A simple example of relief as expressed on topographic maps and interpretive maps may serve further to define what I mean. On topographic maps relief is shown by contours which portray only the elevation and shape of a natural object. Any facts concerning the geomorphic form must be interpreted by someone with ability to read contours as well as a knowledge of landform classification. This is a big order for an untrained layman or a nontechnical executive. The interpretative map relieves the user of the burden of reading contours and analyzing them for landforms by presenting the geomorphic patterns described in terms that can be understood by all.

The cartographer in designing an interpretive map is confronted with the basic question of what form the interpretation shall take. A number of possible interpretations exist in any given subject. A soil map may be interpreted for the genesis of soils, for the suitability for certain crops, or for foundation or trafficability properties. Similarly, a geologic map may be interpreted for suitability of rock for foundations, tunnels, or construction materials. It is obvious, then, that the specific purpose of the map assumes paramount importance and determines its design to a greater extent than in the factual type of map.

In selecting the base for an interpretive map the usual problems are met. Scale, projection, and layout are controlled to a great extent by the data to be shown and the time available for preparation. The amount and type of information on the base can be shown in one of two general ways depending on the relation of interpreted data to the basic data. If the interpreted information is to stand alone as an abstract presentation, the base needs only geographic material necessary to locate the map information. If, on the other hand, the interpreted data is to be related to certain land, hydrographic, or other physical features it is important that these features be portrayed on the base in factual form.

The portrayal of the interpreted data varies considerably according to the type of information being interpreted and the ability of the user for whom the map is designed. For every form of factual data there are a number of different interpretations possible according to the use to be made of the map. Relief data on a topographic map serves as an example of the possibilities of various interpretations. In reading the contours the cartographer may merely interpret and classify his information as to landforms. This is the simplest interpretation possible as it merely translates the factual elevations and shapes of the contours into common terms that are understandable to a person not versed in map reading. The map resulting from such work presents a classification of terrain and is

Presented at the Eleventh Annual Meeting, American Congress on Surveying and Mapping, Washington, D. C., June 18–20, 1951.

very popular with military planners and physical geographers. More complex and specific interpretations can be made of topographic data using the terrain map in combination with other subject material. If there is a critical slope or topographic form that will stop a specific motor vehicle, an interpretive map can be prepared indicating slope in terms of possible movement by the vehicle. Such a map is incomplete, as it is obvious that soil conditions, stream depths, and vegetation also control the movement of the vehicle across country. If this information is combined and interpreted in terms of movement of the vehicle there results a trafficability or cross-country movement map. Although the map presents no contour information or other factual topographic data, it is essentially an interpreted form of topographic information.

In designing an interpretive map the technical or scientific background of the map user is a factor limiting the scope and form of information shown. The basic idea in interpretive cartography is to present factual data in an interpreted form that the untrained user will understand. If a map is prepared to show the depth to groundwater in an area, let us say a county, and is designed for use by farmers it must express conditions in terms understandable to them. Simple categories such as the following—large supplies of soft water ample for dairy farm of 100 head from dug wells less than 10 feet deep, or hard water in small supply ample for household use only from drilled wells over 100 feet deep in hard limestone—are understandable to the ordinary layman and would be satisfactory in the case cited. If the map is designed for a person with limited training in water resources the categories can be more specific and can deal with the anticipated yield in gallons per minute and the chemical content of the water. In the latter case this may appear to be factual type of data but it is actually interpretive since it is based on the interpretation of geology, soil, rainfall, topography, and observed wells in the area.

The use of interpretive cartography today is more extensive than most of us realize. It has long been an excellent tool in the hand of the propagandist, both politically and commercially. It is far more effective to present an interpretation of facts that fit the line of thought being fostered on the public than to present the mere facts themselves. All who engage in propaganda, from politicians through advertisers, have followed the idea, and interpretive maps in the form of posters, as parts of books, or as leaflets are used commonly to put across ideas.

Industry and science use interpretive cartography extensively but along different lines than those of the propagandist. Technical or scientific facts that are difficult for the untrained to understand are presented in interpretive and understandable form. The final cartographic product of most consultant reports prepared for business executives is not a factual one but rather one that is interpreted along lines for which the report is designed.

The most intensive use of interpretive cartography is in military planning and operations. Rapidly moving, mechanized war has brought on many map problems that the topographic map alone cannot solve. Geology, soils, water resources, climate, and a host of other cartographic subjects are intricately integrated in a modern military plan or operation. The specialist's role in the preparation of such data lies in the production of interpretive maps that combine heterogeneous subject material into a finished integrated form that allows the user to arrive at specific conclusions without consulting a multitude of sources.

Supplemental Vertical Control Methods

By EDWARD BARTHOLD
UNITED STATES GEOLOGICAL SURVEY

THE PURPOSE of this report is to review and evaluate the various means of establishing supplemental vertical control for an area to be mapped by photogrammetric methods. The term "supplemental control" will be used in this paper to include any vertical control in addition to basic levels of third-order accuracy or better. Modern methods of photogrammetric compilation have created a need for supplemental control of great extent and accuracy. Previously established methods of field procedure could not keep pace with the rapid progress made in the photogrammetric field and the resultant demand for extensive and refined photo control. The Geological Survey is now employing various methods, either singly or in combination with others, in an effort to determine the best and most economical procedure for the various types of relief and the associated problems encountered. It appears that no one method for determining supplemental elevations is ideal for all conditions ordinarily present in any area to be controlled. The solution, therefore, seems to be a matter of planning and selecting the most appropriate method of obtaining the particular elevations called for by the photogrammetrists. The advantages and limitations of some of the methods now in use or on trial in the Atlantic Region of the Topographic Division of the Geological Survey are considered in this report.

ALIDADE SURVEYS

When the establishment of supplemental control first became a major phase of mapping, the planetable survey was the first solution of the problem. This method was chosen for several reasons. Practically all engineers already had the necessary equipment and were familiar with this type of survey. It was, and still is, the cheapest method of extending vertical control of required accuracy, where there is a road net and the relief is not excessive.

During the earlier supplemental-control projects, only the Beaman arc and foot rod were used. All stadia lines were either double-run from basic level elevations or extended from one spirit-level elevation to the picture points along the route and tied to another spirit-level elevation. The double-run lines were later largely supplanted by using a foot-meter rod and recording both the Beaman arc reading on the foot rod and the vertical angle reading on the meter rod. The two independent elevations determined for the photo points then constituted a tie for the line. This refinement resulted in a time saving of about 25 percent over the double-run method.

It was soon apparent that for contour intervals of 10 feet, or less, the alidade survey must be supplemented with some other procedure. Picture-point elevations were occasionally found to be in error considerably more than the allowable limit, 1/10 of the specified contour interval. Due to compensating errors, both instrumental and human, the actual elevation error at some points along the circuit might exceed the circuit closure. These errors were most prevalent in lines of considerable length (8 to 12 miles) and in those involving great relief. No universal rule can be formulated as to how long a planetable line may be, with the required accuracy throughout, as all the factors involved are variable. The best guide is to make the lines as short (possibly not to exceed 10 miles) and over as little steep relief as possible. To attain shorter planetable lines, additional verti-

Presented at the Eleventh Annual Meeting, American Congress on Surveying and Mapping, Washington, D. C., June 18–20, 1951.

cal control would have to be established by some other method. Additional third-order level lines were not a complete or practical solution due to their high cost and the time required to run them. This need for level lines of greater accuracy than a net of ordinary planetable stadia lines, but cheaper and faster than basic levels, promoted the need for new methods of intermediate precision and low cost. To meet this demand the following methods have been in use during the past 2 years.

THE JOHNSON ELEVATION METER[1]

An electro-mechanical instrument known as the Johnson Elevation Meter (*see* accompanying illustration) for obtaining vertical control has recently been employed by the Geological Survey. This device is relatively new and has not yet reached the final stages of refinement; however, it has definitely proved its worth for extending vertical control from basic level lines. The elevation meter is used by the Geological Survey on a service-contract basis and its actual operation is the responsibility of the owner of the instrument. This paper includes only the planning and reconnaissance performed by the Geological Survey personnel, with a discussion of the results, accuracy, and limitations of the machine.

The approximate location of tentative elevation meter lines can be planned directly on the photographs of the area to be controlled. They must be laid out with respect to existing vertical control. Photo-control points should be planned and selected for each model with the probability in mind that the elevation meter will be used. Although the road network is always a governing factor of the routes chosen for elevation-meter operation, the location of the picture points will often influence the choice when several routes are available. The actual, or final, location of elevation-meter lines is made after a field inspection of the tentative lines. The impassability of roads for the elevation meter or lack of basic control for starting or tying the meter lines often necessitates some change in the original layout.

Suitable points at which the elevation meter will establish elevations are necessarily selected by an engineer in the field. These points are usually photo-identifiable features along the elevation-meter routes which fulfill the following requirements:

1. They are recoverable by the photo-control engineer and later by the field-completion engineer.
2. They are well distributed along the route and at junction points.
3. They should, when possible, be on level ground.

Where dependable ground points cannot be identified on the photo or adequately described in the notes, points similar to the useful elevations fixed by basic levels are established and marked on the ground. This type of point, usually off the road, is of less value to the photogrammetrist than one at road level and slows up the progress of the elevation meter due to the fact that the operator must take a rod reading from the machine to the point.

Tests and checks on the results of elevation-meter operation on field projects of the Geological Survey indicate that it is capable of establishing supplemental-control elevations of adequate accuracy for photogrammetric compilation. At present, contract specifications for acceptable elevation-meter line closures are somewhat more lenient than the accepted rule that all elevations should be correct within 1/10 of the contour interval. This is true only on projects specifying a 10-foot contour interval or less. A study of the closures of elevation-meter lines shows, however, that most of the lines run

[1] This device is described in detail in the following articles:

Wheel Mounted Elevation Meter Records Changes at High Speeds; *Engineering News Record,* April 7, 1949, page 27.

New Car-mounted Surveying Instrument Speeds Geophysical Work, L. S. McCaslin, Jr., *Oil and Gas Journal,* March 10, 1949.

over suitable roads are actually well within limits for 10-foot compilation. It is believed that, by making further refinements in the machine and by assigning it only to suitable routes, consistent closures of 1 foot or less may be attainable.

The outstanding feature of elevation-meter work is its unequalled speed over good roads. One of its unique features is that great relief does not slow its progress. However, when assigned to poor, rough, or unsurfaced roads, its speed is greatly reduced and the probability of excessive closures is increased. This reduction in speed and the reruns caused by poor closures soon reduce the efficiency of the meter below that of other methods. Many mapping projects contain areas requiring intermediate control in which there is a scarcity of roads over which the elevation meter can operate efficiently.

It follows that only certain lines should be attempted by the elevation meter and the remainder planned and executed by other techniques. This classification could very well be made by the field engineer engaged on reconnaissance for the elevation meter.

(Courtesy Sperry-Sun Well Surveying Co.)

ELEVATION METER

A very sensitive pendulum, mounted on the three-wheel trailer, generates an electric signal which varies with the angle of slope as the apparatus is towed along the road. The signal is integrated electronically with another signal generated by a wheel revolution counter to give a continuous record of the difference of elevation from an initial starting point.

FLY LEVELS[2]

Fly leveling seems to be a promising substitute for the elevation meter for the routes over which the meter cannot operate efficiently. This discussion of fly-level operations is the result of a study of only one project of about 180 miles.

The lines for fly-level operations are established and the points for elevations are selected in much the same manner and with the same considerations as those to be run by the elevation meter.

It was found that the most efficient party for running fly levels consisted of two rodmen, a recorder, and the instrument man. The alidade and planetable were used in running the lines. Foot-meter rods 13 feet long were employed.

[2] Fly levels are levels taken "on the fly," so to speak, in such a manner that rapid leveling is accomplished by omitting some of the precautions required for more precise work; for example, sight distances up to 1000 feet are permitted, whereas sights are limited to 300 feet in ordinary leveling.

As these lines were run over very poor roads or cross-country, a jeep was very helpful. Yard-rod level notebooks were used.

The following precautions, limitations, and routines were observed while running fly levels:

1. Sight distances did not exceed 1,000 feet.
2. An approximate balance of foresight and backsight distances was maintained.
3. The instrument was checked daily for adjustment of the telescope level and collimation. The check readings were taken at 750 to 1,000 feet and recorded and dated in the back of the notebook.
4. Turning points were selected on rocks or solid objects and marked with keel.
5. All points established were turning points in the line.
6. The foot readings were estimated to the nearest hundredth foot and the meter side, which was used as a check, was read to the nearest hundredth meter.
7. Notebook checks including page or point checks and day or line checks similar to those made in third-order leveling were used. Also a meter check for the entire line was converted to feet and used as an additional check.
8. A line-closure diagram was prepared.
9. The elevation to the nearest foot was painted at each point on a tree, post, or other prominent object so as to face the point.

Approximately 180 miles of fly-level lines were run in about 9 weeks of operation. The resultant cost of fly leveling was about 50 percent higher than that of the elevation-meter work plus reconnaissance. All fly-level lines on this project were over routes on which the elevation meter had not been able to operate due to the very poor roads.

All the fly-level closures were within limits for mapping with a 10-foot contour interval. At the start of the project a few lines closed slightly over 1 foot. This was proved to have been an accumulated error due to an imperfection in the paper-faced rods. The rods were corrected and closures thereafter were all well under 1 foot. It is recommended that only painted rods be used for this work.

Fly levels used in connection with the elevation meter can supply adequate control of the necessary accuracy and at low cost in most areas. For the relatively small areas where the methods so far discussed are not suitable, the engineer may choose from other more practical methods of establishing supplemental control.

ALTIMETER AND MISCELLANEOUS SURVEYS

Certain undeveloped areas in the East are so difficult of access that the methods previously discussed are not appropriate. These areas are without motor roads, which eliminates any elevation-meter work. The relief is usually very great, slopes are steep, and foliage and undergrowth are dense. These factors make any form of spirit leveling or even plane-table surveys arduous, slow, and costly. It is in these areas that altimeter surveys or other special methods are worthy of consideration.

Altimeter surveys, using the two-base method, have proved to be well within the accuracy required to control 40-foot contour maps. For some areas to be contoured at the 20-foot interval, the altimeter may be used successfully where conditions of the terrain and weather are favorable and experienced engineers are available to supervise the work. With proper planning and efficient execution, an altimeter survey is the most economical method of supplying vertical control in rugged and remote areas where their accuracy is adequate.

When the altimeter is employed to control 20-foot contour mapping, the photo points are visited by two engineers on different days and using different altimeters. This provides not only data for checking any variance in the altimeters, but a verification of the field identification of the selected photo point.

Occasionally only a relatively small part of a project is inaccessible by conventional methods of surveying. These small isolated areas do not warrant the extensive planning and special personnel required by an altimeter party. Some special technique such as determining elevations by checked vertical angles must

then be worked out to fit the conditions encountered.

CONCLUSION

This report endeavors to show that photogrammetric map compilation requires extensive vertical control of a definite degree of accuracy. Several means of establishing this control are now in use or are being tested under various conditions. In order to supply adequate elevations at the lowest possible cost, it is imperative that the most suitable method or combination of methods be used. This in turn requires, on the part of the engineer, a working knowledge of the various techniques that may be employed to get the desired results.

In summary, it should be emphasized that each of the various supplemental control methods has certain advantages, but at the same time disadvantages and limitations. No one procedure is superior under all conditions, but each method, when properly assigned, may excel the others for a specific task.

❦ ❦ ❦

The Original Source

(Author unknown)

LAWYERS, like doctors and men of all other professions, have a line of humor peculiar to their own activities. From West's "Docket" comes this sparkler on the only complete and airtight abstract ever conceived.

A certain man contracted to buy a large tract of land in Louisiana, subject to abstract showing good title. The abstract of title was turned over to the purchaser's lawyer for examination. After going over the title, the lawyer pronounced it good as far back as it went, but requested a record dating back further than the complete abstract that was furnished.

Herewith is the reply to his request:

There are no records or archives available which concern the title of the above-described land prior to its acquisition by the United States Government.

However, I believe, from a historical standpoint, I can enlighten you as to the title in such a way that the objections you have pointed out will be waived.

This land was acquired by the United States Government in 1803 from France under what we now refer to as the Louisiana Purchase.

France acquired the land by virtue of the fact that La Salle took possession of it for the King of France in 1684. La Salle's exploration was made possible because a young man by the name of Christopher Columbus discovered the New World on the 12th day of October 1492 and claimed it for Spain.

Columbus got his authority to make the aforesaid voyage of discovery from Isabella, Queen of Spain.

Isabella got her authority to sponsor the voyage from the Pope of Rome.

The Pope of Rome got his authority by virtue of the fact that he said he was the Vicar of Christ on earth.

Christ got his authority from the fact that He was the Son of God and God created the earth.

Further than that no records are available.

❦ ❦ ❦

Saint Louis University, the first institution of higher learning in the world to establish a Department of Geophysics, has had its curriculum in geophysical engineering accredited by the Engineer's Council for Professional Development, the intersociety, intraprofessional body that acts as the agent of all the engineering societies of the United States and Canada.—*Science*, November 16, 1951.

Use of Plane Rectangular Coordinates in California

By CZERNY ANDERSON
LAND SURVEYOR

LAND SURVEYS and their relation to the descriptions of land contained in deeds and opinions of title require not only a definite understanding of the basic principles involved in making the surveys, but a clear interpretation of the results obtained by the application of these principles.

In applying a description to the earth's surface for the purpose of defining thereon a given area of land, it becomes evident that the points so defined must be perpetuated on the earth's surface by some means in order that the boundaries to the area may be recovered at any time in the future. In the past when lands were of little value this has been done by setting posts and rocks, blazing trees, and by depositing physical objects to denote the locus of the point established and subject to recovery. Whether the exact position of this established point could subsequently be located was, of course, open to dispute.

As the country became more intensely developed and the value of land increased, efforts were made to set monuments of such a character that would withstand the elements. However, no means were found to protect the points so established against destruction, or from the unscrupulous surveyor or other person who deliberately removed or destroyed the evidence incident to the point itself.

Controlled surveys completely changed this picture of uncertainty. By their use, a uniform standard of accuracy can be maintained throughout all parts of the land involved and there need never be any misgiving regarding the accuracy of the junctions with any other lands upon which similar surveys are executed.

The U. S. Coast and Geodetic Survey has established a system of Plane Rectangular Coordinates for every State in the Union. Each system comprises one or more definite mathematical projects which are so well defined that they can be approximately 158 miles wide and of any length desired without introducing material divergencies, due to the earth's curvatures, between actual measured distances or angles and those given by the coordinate positions. The usual maximum divergence is one part in 10,000, and for the greater part of each system, the divergence is far less. To use this system it is necessary only to connect a survey with the basic triangulation net of the United States wherever Coast and Geodetic Survey triangulation exists. This can be done by direct angle and measurement.

The transfer of real estate is surrounded by difficulties out of proportion to the values involved. This is particularly obvious when compared with the transfer of other forms of wealth. These unnecessary costs and delays, together with investigations, surveys, and uncertainties of boundary location, tend to reduce the negotiability of real property and to make it static. The uncertainty of boundary location is caused basically by the lack of a permanent system of monumentation from which surveys may originate, together with faulty descriptions and blunders in the surveys themselves. Much, if not all, of this confusion is preventable by the use of the Federal network of control. However, as in all other forms of progressive thought, it is necessary to educate not only the surveyor and the title man to its benefits, but the public itself. By this I mean that, if and when those persons charged with the responsibility of land management and ownership can be brought to a full understanding of the

many advantages offered by adoption of the Coast and Geodetic Coordinate System of control in survey location of boundaries, popular demand will bring it into universal use.

TRIANGULATION CONTROL IN CALIFORNIA

The Coast and Geodetic Survey adopted the Lambert conformal projection with two standard parallels for States with greatest extent in an east-west direction, and the transverse Mercator projection where the greatest extent is in a north-south direction. In California, the Lambert conformal projection, with 6 zones, was adopted, commencing with Zone 1 in the north end of the State and ending with Zone 6 in the south end of the State. Los Angeles County was subsequently established as Zone 7.

Each triangulation station has a definite position on the face of the earth. Its latitude or angular distance to the north of the Equator and its longitudinal or angular distance west of the initial meridian, through the observatory in Greenwich, England, are determined and are matters of record in the office of the Coast and Geodetic Survey. Numerous publications prepared by this bureau furnish triangulation data. The printed publications are sold by the Superintendent of Documents, Government Printing Office, but data in lithograph form are distributed free by the Coast and Geodetic Survey, Washington, D. C. There is only one point on the earth which has a particular latitude and longitude. Therefore, even though the marker of a triangulation station should be destroyed, it would be a simple matter to relocate the station by making observations from nearby triangulation stations, the marks at which had not been disturbed.

Special Publication No. 202, published by the U. S. Coast and Geodetic Survey contains values of some 2200 precisely located, permanently monumented primary stations in California, embracing wholly or partially every county in the State. The use of this system provides a simplified means of stating accurately the position of a point on the earth's surface by giving the latitude and longitude of the point in question, either in the form of spherical coordinates or plane coordinates.

GEODETIC SURVEYING

In determining the latitudes and longitudes of triangulation and traverse stations, it is necessary to take into account the size and shape of the earth which is not a plane, but a curved and irregular surface.

For purposes of surveying and mapping, an ideal surface for the earth is assumed, as though the surface were entirely composed of water. This assumed shape is not a sphere, but an ellipsoid of revolution.

Geodetic surveying comprises the extensive work of making observations and computations of positions on the surface of this assumed spheroid. Such work becomes extremely complicated when the surface extends over large areas. The stations or points on the earth's surface are expressed in terms of latitude and longitude; in other words, each one is referred to a definite place in the network of meridians and parallels that are assumed to cover the surface of the earth in a definite and coordinated manner. Due to the complicated nature of geodetic surveying, it is impracticable to use it in ordinary survey work, partially due to the technical ability and costly equipment required.

THE STATE COORDINATE SYSTEM

In order to make the spherical coordinates usable for local surveys, a given area is treated as a plane, and coordinates are computed for each geodetic position. Thus, it is not necessary to make the involved computations required as when the curvature of the earth is taken into account. Here in California, the zero point for the coordinates in any zone has been established far enough west and far enough south so that all positions in that zone within the State fall north and east and are identified by X- and Y-coordi-

nates, the X-coordinate denoting the position east and the Y-coordinate denoting the position north of the origin. With this plane coordinate system available, the survey methods usually employed by engineers and surveyors may be used in property boundary and other location work. By the use of the State Coordinate System it is possible to fix upon the earth's surface the respective positions of areas directly related with each other; for example, the recovery of a point upon the earth's surface which was identified by a physical object which has since disappeared, or in a case of a controversy as to the original position of a monumented point. Such recovery, or locus, is definitely determinable provided the coordinates thereof are matters of record or are ascertainable.

Under the old system much was left to a determination based upon chained measurements and subject to the following sources of error:

1. Incorrect length of tape.
2. Error due to temperature.
3. Error in alignment.
4. Variation in the pull exerted.
5. Error in the setting of chained points.
6. Error in the reading of the tape.
7. Error in the recording of the measurements.

The U. S. Coast and Geodetic Survey in establishing its survey control points has brought into being a system to which all surveys may be tied and referenced. The monumented positions represent three orders of accuracy: First Order (probable error not to exceed 1 in 25,000), Second Order (probable error not to exceed 1 in 10,000), Third Order (probable error not to exceed 1 in 5,000). In addition, the U. S. Coast and Geodetic Survey has described the procedures necessary to obtain the accuracy required, such as type of instruments, mathematical formulas, etc. Thus it is possible for a multiplicity of surveys to arrive at the same identical point on the earth's surface.

Under the coordinate system of point identification, it has been held that so long as monuments and incidents thereto remain in their original position and are subject to positive identification, such monuments and incidents thereto control the locus of the established point. In the absence of the above, recourse is made to the coordinate system as a precise means of recovering the position.

At present there seems to be some confusion among surveyors and those dealing with descriptions as to the interpretation of the base used in the Lambert projection. Our California State law is such that it is only necessary to disclose the basis of bearings used. When the Lambert grid projection is used, it should be noted that the bearings are based upon U. S. Coast and Geodetic stations; in which case they come well within the legal requirements regarding descriptions of land. Reference can also be made to the California Coordinate System for identification of the control used. The writer has used the following forms for both systems:

Description No. 1

That portion of the Rancho Santa Ysabel, in the County of San Diego, State of California, as the same is fully described in the Patent from the United States of America to Jose Joaquin Ortega *et al*, recorded in Book 1 of Patents, Page 72 *et seq.*, in the Office of the County Recorder of said County, and as delineated on the plat of said Rancho Santo Ysabel, approved May 9, 1871, a copy thereof being attached to said Patent; said portion being described by bearings, distances and coordinates in terms of the California Coordinate System, Lambert Grid—Plane Coordinate Projection, Zone 6, California; based locally on U. S. Coast and Geodetic Survey Triangulation Stations "Ballena" and "Black Mt." as reported in their Special Publication No. 202, and particularly described as follows:

Beginning at a 5-inch concrete pipe set to designate Corner *SY* No. 20 in the original mound of rock identified by course and distance from the oak bearing tree reported in said Patent survey (Lambert Coordinate X = 1,860,180.90 feet, Y = 342,382.38 feet); thence N 23° 57′ 08″.89 W 6189.44 feet to a 5-inch concrete pipe with metal plate stamped *AP-M* 10 and *AP-S* 1 set at a point on the westerly boundary of said Rancho Santa Ysabel; thence leaving said westerly boundary S 89°

56′ 50″ E 2164.00 feet to a 5-inch concrete pipe with metal plate stamped *AP-M* 9 and *AP-S* 2 (Lambert Coordinates $X = 1{,}859{,}831.92$ feet, $Y = 348{,}037.27$ feet); thence S 12° 01′ 52″.14 E 3468.03 feet to a 5-inch concrete pipe with metal plate stamped *AP-S* 3 and *AP-MP* 8; thence S 41° 08′ 55″.90 E 1955.99 feet to a 4″ by 4″ wooden post set in rock mound to designate the Corner common to Sections 19, 20, 29 and 30, Township 12 South, Range 3 East, S. B. M., with metal plate stamped *AP-S* 4 and *AP-MP*; etc.

Description No. 2

That portion of the Rancho Santa Ysabel, in the County of San Diego, State of California, as the same is fully described in the Patent from the United States of America to Jose Joaquin Ortega *et al*, recorded in Book 1 of Patents, Page 72 *et seq.*, in the Office of the County Recorder of said County, and as delineated on the plat of said Rancho Santa Ysabel, approved May 9, 1871, a copy thereof being attached to said Patent; said portion being described by use of the U. S. Coast & Geodetic Survey's Lambert Grid—Plane Coordinate Projection, Zone 6 California; based locally on Stations "Ballena" and "Black Mt.," as reported in their Special Publication No. 202 and particularly described as follows:

Beginning at a 5-inch concrete pipe set to designate Corner *SY* No. 20 in the original mound of rock identified by course and distance from the oak bearing tree reported in said Patent survey (Lambert Coordinate $X = 1{,}860{,}180.90$ feet, $Y = 342{,}382.38$ feet); thence N 23° 57′ 08″.89 W 6189.44 feet to a 5-inch concrete pipe with metal plate stamped *AP-M* 10 and *AP-S* 1 set at a point on the westerly boundary of said Rancho Santa Ysabel; thence leaving said westerly boundary S 89° 56′ 50″ E 2164.00 feet to a 5-inch concrete pipe with metal plate stamped *AP-M* 9 and *AP-S* 2 (Lambert Coordinates $X = 1{,}859{,}831.92$ feet, $Y = 348{,}037.27$ feet); thence S 12° 01′ 52″.14 E 3468.03 feet to a 5-inch concrete pipe with metal plate, etc.

The old adage that "The work is no better than the tools used" applies to surveying. The U. S. Coast and Geodetic Survey has described the procedures, including the type of instruments, necessary to acquire the various degrees of accuracy in the use of triangulation control. When a position has been determined it should be properly and adequately monumented to perpetuate the physical location of the point. In addition, the name or license number of the surveyor establishing the station should be attached. In the event of destruction, the point so established can be recovered with the same degree of accuracy by using the procedure originally employed.

By the use of the Lambert projection and aerial photography, land boundaries and related surveys may be executed without the use of random ground lines. Transit points used and brush lines cleared in running random ground lines are often mistaken for the positioning of the final or true line, and lead to disputes and litigation.

In order to facilitate the use of the Lambert projection and the State Coordinate System it is suggested by the writer that the County Surveyor of each County provide his office with a complete set of Geodetic Manuals of Field and Office Work and index maps of control, both distributed by the U. S. Coast and Geodetic Survey, dealing with this subject of controlled surveys, as a reference library for surveyors.

To those interested in obtaining information relative to the practical application of this method of survey procedure it is suggested that the following publications be carefully studied:

Definitions of Terms Used in Geodetic and Other Surveys (Coast and Geodetic Survey Special Publication No. 242).

The State Coordinate Systems—A Manual for Surveyors (Coast and Geodetic Survey Special Publication No. 235).

Communication, transportation, and the constant shifting of population develop interrelated problems involving the accurate location of points and things upon the earth's surface. To perpetuate and make recoverable the factual data descriptive of the points and things so established, demands a method of survey control, simple, accurate, and uniform in its application over large areas. National and State systems of plane rectangular coordinates supply this method.

Surveying and Mapping and the Point 4 Program

By DR. HENRY G. BENNETT*

ADMINISTRATOR, TECHNICAL COOPERATION ADMINISTRATION, DEPARTMENT OF STATE

ALMOST EVERY DAY someone reminds us that we are at war. Yes, we are waging war in Korea—a war we did not seek. We are also engaged in another war, which, as President Truman has said, is "the only kind of war we seek—the good old fight against man's ancient enemies: poverty, disease, hunger, and illiteracy."

Point 4 is leading that good old fight in 34 countries of Asia, Africa, and Latin America. We have strong allies in this fight. They are the peoples—more than a billion of them—in the so-called "underdeveloped" regions of the world, who are determined to break out of the vicious circle of poverty, hunger, disease, and illiteracy. They have asked our help, and they are getting it.

The help these people are receiving from us is not in the form of dollars, for Point 4 is not a "giveaway" program. They are getting the services of American technicians: people skilled in food production, engineering, the control of disease, education, and the organization of modern government.

In the Point 4 Program we begin with what people have, and in almost every case we have to begin with planning, mapping, and surveying, to find out what their resources are and how they can be used to benefit their country.

We have a golden opportunity to help people of so-called "underdeveloped" areas help themselves: to plan well; to put first things first; to put roads and cities and dams and ditches in the right location; to divide units of land so they are neither too large nor too small for the average families that wish to live on them; and to determine what land should be cultivated, and how it should be cultivated so that erosion, soil depletion, and dust storms will not rob the people of their productive land. We need good tools and good basic information to do these things. Maps are both valuable tools and sources of much basic data.

Perhaps good surveys and maps can prevent a repetition of what happened out my way, along the boundary line between Oklahoma and the Texas Panhandle. After years had been spent establishing a pattern of ownership and government along the old assumed line, an accurate survey by the U. S. Coast and Geodetic Survey, ordered by the Supreme Court, moved the line east so far that 44.6 square miles formerly thought to be in Oklahoma were included in Texas. You can imagine the subsequent disruption in local government, taxation, and land ownership!

One of the places where Point 4 has a chance to help people do things right is in the Cochabamba-Santa Cruz area of Bolivia. A highway is being built into this little-known area which is fertile enough to provide abundantly for the needs of the people now living there, and many more. At the present time most of these people are poor and undernourished; they must import large quantities of food and manufactured articles which they could produce themselves. Point 4 is helping develop this area. The first step is to make basic surveys and plans with the help of

The substance of a speech presented at the Eleventh Annual Meeting, American Congress on Surveying and Mapping, Washington, D. C., June 18–20, 1951; since this date there have been some changes and much progress in the Point 4 Program.

* The author, Dr. Bennett, was killed in an airplane accident in Iran in December, 1951.

experts. These plans and surveys are paving the way for loans and private capital which will finance whatever big construction jobs should be undertaken to develop the area.

One of the first things we must do there is make aerial surveys and maps. Luckily the highway through this virgin area won't be completed until 1953, so there is time to do the basic surveying and planning. Teams of United States and Bolivian experts, working together, will make general surveys of the soil, climate, vegetation, present land use, population distribution, marketing, local industry, monetary systems, and so forth. Experiment stations in Bolivia are already determining what crops grow best in the different areas and environments. After these surveys have been made, the experts will make recommendations as to the following questions: Where should the secondary feeder roads be located? What are the best locations for small industries and marketing centers? What land should remain in forest and grass? Where should certain crops be cultivated? What size land units should be established in these different areas?

The basic tool on which all these surveys and plans depend is a map—or a map substitute in the form of aerial photographs. We couldn't get along without it.

Not long ago my staff called a meeting of a group of experts in mapping and map use—several of whom are in this audience. They were asked to advise on the economic feasibility of a half-million-dollar mapping program proposed for the little African republic of Liberia, a substantial part of the cost to be borne by that country. It developed that the plan was not only feasible, but that in planning the economic development of that country it was a necessity—we couldn't afford *not* to map it.

The savings to the road-building program alone, in the Liberian Government's 5-year development plan, would more than pay for the aerial photography and preliminary mapping. And the same photographs and maps could be used profitably for soil surveys, forestry surveys, agricultural planning, geological surveys, the location of hydroelectric works, census-taking, land ownership and tax reforms, and for malaria control involving drainage and spraying. Thus, the mapping, if accomplished early in the development scheme, will pay for itself many times over and leave its indelible stamp in the pattern of well-established public works and culture.

I was especially impressed with one example cited at that meeting. It seems that, during construction of the Inter-American Highway, a location for a certain 24-kilometer section had been proposed by the old conventional ground survey methods without the use of aerial photography or topographic maps. An American engineer, ignorant of this survey and location, proposed another location based on a study of aerial photographs without going out on the ground. Faced with the conflicting recommendations, the authorities insisted on a comparison on the ground. It was found that the location based on aerial photographs, as compared with the other, saved $400,000 in bridging costs and $300,000 in excavation costs, a total saving of $700,000 in 24 kilometers.

I am sure you realize that water is the key to virtually all development throughout the arid Middle East. In Saudi Arabia we have two American technicians making a survey of water resources, principally those underground. They went into the field with almost nothing in the way of mapping information, but were soon supplied with aerial photographs taken for them by one of the commercial members of this Congress. After using the new photographs for a short time, the chief of this mission estimated that 5 to 7 years in this survey of water resources had been saved by this 2-week aerial survey. Plans are now being made to convert this photography into finished maps.

So it goes over the globe—developmental work is aided and advanced by surveying and mapping—or hindered by its absence or obsolescence. And where development is retarded, there thrives poverty and pestilence, hunger and ignorance, despair and discontent, in other words a fertile ground for Communism.

By its very physical nature, surveying and mapping helps tie nations together. The works of nature portrayed on maps do not stop at international boundaries. The water from the watershed of a stream system does not stop or turn back because it comes to a man-made political boundary. Geological formations, many containing oil and valuable minerals, are governed only by natural boundaries and forces of nature which were in being long before political boundaries were ever conceived. It follows naturally that the maps on which these features are portrayed and on which their use is planned, must likewise extend across political boundaries to fulfill their purposes. It logically follows, too, that commerce, engineering, and defense considerations, which are dependent on these features of nature, should recognize no national boundaries if they are to function freely in the most efficient manner and make their maximum contribution to mankind.

One good approach to international difficulties is through the cooperation of the mapping and charting engineers of various countries who work together despite their countries' differences in diplomatic or commercial relationships.

It is inspiring to see the common interests of neighboring sovereign nations being tied together by surveys and by technical cooperation which operate freely and with dignity across artificial barriers of political boundaries, leaving selfish factors behind. I sincerely hope that this new trend portends more worthy and constructive things to come. I hope that the theme and pattern for future international cooperation, in the interest of prosperity and peace, may be along proved lines of cooperation, with surveying and mapping blazing the way.

* * *

New Aids in Determining Elevation

A new altimeter has been designed by Wallace & Tiernan Products, Inc., to withstand the most severe service in the field. It meets the requirements of military organizations. For durability, the altimeter mechanism is supported by a shock mounting in a sturdy aluminum case with a latched metal lid. The instrument case contains a desiccant to absorb moisture and the instrument may be completely sealed to protect it during transport. The new altimeter employs a mechanism featuring the self-balancing principle and custom calibration.

An altirule has been designed to compute elevations directly from observations when using the two-base method. Information on the altimeter, the altirule, and modern altimetry methods is available from the manufacturer.

A Planned Program of Resource Surveys

By FOWLER W. BARKER
SECRETARY, ASSOCIATION OF PROFESSIONAL PHOTOGRAMMETRISTS

PRESIDENT TRUMAN'S message to Congress on June 24, 1949 made it clear that to "promote higher standards of living, full employment, and conditions of social and economic development" in the undeveloped areas of the world, a plan is required w ich will best serve this end while avoidi undue risk to the public and private capital required to put it into operation.

Such a plan requires full consideration of the potential resources of the area for which it is developed, as well as its social and economic status. This involves a complex, yet integrated survey involving many specialized studies. Important factors that must be accurately assessed before a program of development can safely be encouraged are:

(1) The Agricultural Potential
(2) The Forestry Potential
(3) The Mineral Potential
(4) The Hydrological Potential

In this connection, it is also necessary to make studies of the geography, the climate, and the population, before it is possible to determine whether the potential resources are located in areas inhabited or habitable by the people necessary to develop them, and whether they are located near enough to markets to render their development profitable.

To collect all the required information in a short time, and at a low cost, will demand a well integrated and impartially administered survey program of a high order of accuracy and of considerable magnitude. Such a program will utilize aerial photographs, photogrammetric mapping, electronic equipment for measurement of distances, and air observations of magnetism, complemented with ground surveys made by scientifically trained observers.

It is recognized that maps provide the best means of recording the location, character, and magnitude of resources. The topographic map is the basis upon which resource surveys are developed. As you know, aeronautical charts, geologic maps, soil maps, vegetation maps, forestry maps, hydrologic maps, and hydrographic charts are prepared upon the topographic base. Again, this base map may also be used to show the location and character of population, industries, housing and other social and economic data compiled from records and surveys.

Regardless of the area under consideration, a program for the appraisal of resources should follow a definite, logical sequence of investigation. This program would include the following stages:

PRELIMINARY STAGE

Collection and study of all the available information concerning the area, and a coordination of this information under the proper categories. This study may indicate the character of the resources that are to be appraised, such as agriculture, mineral deposits, and forests.

RECONNAISSANCE STAGE

(*1*) *Purpose.*—To make a general coverage of all the area and locate zones whose potential resources appear to be profitable and justify immediate appraisal, by virtue of their location and concentration.

To prepare the basic topographic maps essential to safe transportation and further development.

To make it possible to plan the most economical program of detailed investigations and surveys.

Presented at the Eleventh Annual Meeting, American Congress on Surveying and Mapping, Washington, D. C., June 18–20, 1951.

(*2*) *Results.*—Aerial photographs, as a source of general information, will give an indication of geological structure; forest and vegetation coverage; soil types and classifications; watershed areas for water supplies and flood control studies; available routes for transportation, both land and air; geographic data such as coast lines, lakes, mountains and rivers; climatic variation based upon vegetation; and population distribution.

The first, or reconnaissance phase, makes it possible to determine zones in which potentially profitable resources are located. These require more intensive surveys and examination as indicated in the appraisal stage.

APPRAISAL STAGE

This is for the purpose of determining the economic practicability of developing the potential resources located by reconnaissance methods. The application of the methods that can be used to prepare inventory maps of the various potential resources is considered briefly for some of the important categories.

(*1*) *Agricultural Potential.*—The overlapping photographs may be examined stereoscopically, interpreted, and coordinated with data collected by rapid ground surveys for the purpose of classifying land capabilities. Soil types can be outlined on suitable photography by a study of land forms and the type of vegetation they support, thus rendering soil mapping quicker and less costly. Slope classes can be measured photogrammetrically.

Crop surveys can be carried out very rapidly by an air survey, acreages estimated, and badly drained land identified. Erosion is easily recognized on air photographs and rapid ground checking will then determine its extent.

Information thus obtained can be coordinated to determine the agricultural potential of the area being investigated.

(*2*) *Forestry Potential.*—The procedures followed in making accurate forest inventories by using air photographs coordinated with field checking are well established. Photographs properly interpreted by a trained forester, sometimes making use of tri-camera photography, give a classification of forest types including species composition, height, density, site, and unmerchantable areas. Field checking is used to establish the accuracy of the interpretation with respect to species, densities, site, and type boundaries and to collect data necessary for the computation of volumetric estimate.

Inventory information, including the boundaries of the various species, is transferred to the base map, prepared from small-scale photographic coverage. It is interesting to note that accuracies are usually within 10 percent as compared to less than 50 percent obtained by conventional ground methods. Again, by air survey methods, the cost is one-third to one-fourth and the time required only one-tenth that required by the older methods.

(*3*) *Mineral Potential.*—In localizing the search for ores and oil, photogeology coordinated with aero-magnetic surveys is a valuable aid to the geologist and geophysicist. It indicates areas where exploration by direct methods, such as seismic or electrical, or drilling may be worthwhile.

Mapping of geology may be done either on the air photographs themselves or on accurate planimetric maps produced from them. Preliminary interpretation through stereoscopic examination of the photographs is followed by a transfer of the geological detail from the base map. A field check of representative rock outcrops will provide information for a final interpretation and a complete geological map. From the photographs, individual outcrops, claim lines, detailed structure (such as faults, fractures and joint patterns), and rock formations may be differentiated. Rock types are identified from ground checks.

The aero-magnetic survey is accomplished by an electronic device known as the airborne magnetometer. It detects and records changes in the strength of the earth's magnetic field, thus indicating the possible presence of ore bodies or oil beneath the earth's surface. The results of an aero-magnetic survey are compiled into a magnetic contour map or a series of magnetic profiles.

These proved methods furnish the geologist and geophysicist invaluable information at a low cost for localizing and assessing geological resources.

(*4*) *Hydrological Potential.*—Knowledge of available water resources is a prerequisite to the successful development of all other resources. The information obtained from air photographs, topographic maps, soil maps, geologic maps, and magnetic contour maps all contributes to the appraisal of water re-

sources. Surface waters such as lakes and rivers, together with their elevations, are shown on the topographic map, thus indicating available sources of surface water. Watershed areas may be outlined on the map, storage basins and dam sites conveniently located to provide for the development of water supplies for power, irrigation, and flood control projects. Ground water supplies may be indicated by an examination of geologic structure, together with geophysical exploration.

Ground surveys give information such as soundings, stream velocities, and quality of water. An accurate appraisal of water resources will require continued ground observations for a long period of time because of the variations in the natural processes of the hydrologic cycle. But the information obtained from the air photographs and cursory field checks will be generally satisfactory for a preliminary appraisal of water resources.

Potential resources of the area are determined and available for sources of capital. Information is available upon which orderly development of the area can be planned. Maps and charts are available for the planning of construction.

CONSTRUCTION STAGE

The purpose of this stage is to bring to completion by construction or otherwise the planned improvements indicated by the appraisal, and thus to promote social and economic development, higher standards of living and full employment, as well as to reduce construction costs for expanding industry and population shifts.

Aerial photocoverage of a proposed job will assist a contractor in submitting a bid, since it will reveal otherwise unforeseen obstacles and difficulties. It can be of value in deciding on the type of machinery to be used and the method of transporting it, in spotting camp sites, and in arriving at an over-all plan of operation.

The photographic maps prepared by photogrammetry are useful in planning the construction of roads, railway lines, and pipe lines. They are also necessary to hydroelectric power development for locating generating plants, dam sites, and power lines.

SUMMARY

Sound planning must be based on accurate information. This is only obtainable from a coordinated survey program. A coordinated program of Natural Resources Survey requires work to be carried out in four stages.

(*1*) *Preliminary Stage.*—All existent information is collected, sorted and weighed.

(*2*) *Reconnaissance Stage.*—The area in question is mapped and potential resources are located.

(*3*) *Appraisal Stage.*—Areas of greatest potential are subjected to more detailed scrutiny and assessments are made of the available quantities of material and the economic and human factors which determine their trade value.

(*4*) *Construction Stage.*—The building of transportation systems, communities, power developments, and industries is expedited and its cost reduced by efficient surveys.

The division of financial responsibility does not concern this brief. However, it may be pointed out that the cost of construction planning-stage surveys is normally borne by capital, as part of the cost of construction.

Each of the stages described determines the extent and urgency of the requirements for survey under the next stage. In this way, the cost of the work is reduced because the right area is covered at the right time. All surveys should follow this orderly sequence, although the stages will overlap when detailed work is expedited to bring rapid development to one area and is shelved for the time being in another area which is less promising.

Boundary Problems in Cartography

By ARTHUR R. HALL
U. S. GOVERNMENT GEOGRAPHER

IN THE DAYS when Hitler was beginning to embark on his career of conquest, a journalistic wit remarked that map makers had invented a new type of map. This map came equipped with rubber bands for boundaries, so that the user could stretch the boundaries from day to day in accordance with the current headlines. Doubtless most cartographers, within the past decade or so, have wished for some such device to lighten their burden of responsibility for the correct portrayal of the shifting and uncertain boundaries of our times.

Among the most pressing problems faced by the cartographer in the matter of international boundary representation are those that have to do with the new boundaries and limits of administration set up since the end of World War II. The new boundaries of Bulgaria, Finland, Hungary, Italy, and Rumania offer few problems, for peace treaties are now in force for those countries establishing a legal basis for the boundaries. In the case of Germany, Japan, and certain areas bordering the Soviet Union, however, the situation is more complicated. The statesmen of the Big Three powers after the war made arrangements regarding German and Japanese territories, but these arrangements have never been formalized by peace treaties.

The western limit of Polish administration along the Oder and Neisse Rivers and the east-west line separating the Soviet from the Polish-administered area in East Prussia cannot be considered as definitive boundaries. For similar reasons the Soviet administration of the former Japanese territories of southern Sakhalin Island and the Kurile Islands may be considered as a *de facto* situation.

Presented at the Eleventh Annual Meeting, American Congress on Surveying and Mapping, Washington, D. C., June 18–20, 1951.

The Soviet Union absorbed the three Baltic states—Estonia, Latvia, and Lithuania—at the end of the war. The United States Government refused to recognize this act. In addition, a boundary was defined between the Soviet Union and Poland which gave a large segment of territory to the U.S.S.R., but the United States does not consider this boundary final.

In large areas bordering the U.S.S.R., therefore, the boundaries are in a doubtful status. The cartographer finds himself called upon to find some compromise position between the realities or jurisdiction on the spot and the official policy of his government. On maps prepared for the Department of State two sets of boundaries are represented in the Poland and Baltic States area. One set shows the boundaries and limits of national administration actually in effect, regardless of whether they are recognized as definitive boundaries by the United States. (Fig. 1.) This set of boundaries is emphasized by weight of line or color overprint. The second set shows the pre-war boundaries of Poland and the Baltic States not now in effect. These boundaries are given less emphasis than the first set and are represented only by light dashed or dotted lines. Maps prepared in this manner are accompanied by a boundary disclaimer note.

Another method has been suggested for representing these boundaries, especially on medium and large scale maps. (Fig. 2.) According to this method, only the boundaries and limits of national administration actually in effect are shown. Pre-war boundaries which still function as such are represented by the standard international boundary symbol. The *de facto* limits of administration or boundaries not fully recognized by the United States government are shown by a dotted line of the same weight as the standard

FIGURE 1.

FIGURE 2.

symbol. It is also desirable to accompany this type of boundary representation by a boundary disclaimer note.

Unsettled boundaries of newly-created states form a second class of problem boundaries for the cartographer. The most outstanding examples of this class are the armistice demarcation lines between Israel and its neighbors. (Fig. 3.)

FIGURE 3.

The series of armistices between Israel and the bordering Arab states, which brought the fighting in Palestine to a close, established demarcation lines separating the forces on the one side from those on the other. Several neutral zones or demilitarized zones were created from which the forces of both sides were excluded. It was specifically stated that the armistice lines were not to be considered as final boundaries, but since peace negotiations have so far been fruitless, the armistice lines do function as the effective limits of Israeli administration. The map-maker appears to have no choice but to represent the armistice demarcation lines as the limits of Israel, except where the armistice lines are identical with former boundaries of Palestine, and to show them by means of a symbol distinct from the standard international boundary symbol. If scale permits he would probably be well-advised to represent the neutral and demilitarized zones also.

In the third category of boundary problems fall the boundaries which have been subject to dispute for a long period of time. An example of this category is the eastern part of the boundary between Honduras and Nicaragua. At one time the dispute over this boundary was submitted to the arbitration of the King of Spain. He ruled in favor of a line along the Segovia or Wanks River, which is the boundary generally shown on our maps. This boundary appears to be acceptable to Honduras and that country refuses to admit that a dispute exists. Nicaragua, on the other hand, does not accept the Segovia River boundary. Maps published in Nicaragua shown a large area north of the river as in dispute. This is a dilemma for the neutral map-maker. If he represents the boundary as in dispute he risks the displeasure of Honduran officials; if he represents it as fixed and unquestioned he lays himself open to criticism from Nicaraguan officials. About the happiest solution yet found for this problem is to show the boundary along the Segovia River and to label it "boundary of the award of the King of Spain, 1906." This takes note of an objective fact which probably neither side would deny.

In the fourth category of boundary problems are those of the indefinite or nonexistent boundaries. One frontier area of this type lies in the mountain fastnesses of Central Asia. No acceptable boundary has ever been defined along the Himalayan ranges between India and China. Survey of India maps are realistic in this matter and show no boundary. Other British publications, official and unofficial, however, represent a boundary line. Chinese maps show a line which lies considerably to the south of the line represented by British maps.

American maps of the area generally depict a boundary in accordance with British precedents. There seems to be no good reason to break this habit of long standing, but on fairly detailed maps the interests of accuracy would seem to require that the boundary be indicated as indefinite, either by lettering along the line or by line symbol.

Finally, in the fifth category of boundary problems are those concerned with various types of limits in the high seas. True boundaries can extend out into the sea only as far as the territorial waters of the countries delimited. Cartographers may draw lines through the high seas to indicate the separation of islands belonging to one country from the mainland of another country, or may encircle scattered islands with a line to indicate that they belong to one country. Such lines may serve as visual aids for the map user, but they cannot be considered as international boundaries. In a few instances lines of allocation in the high seas have been defined for the purpose of conveying sovereignty over islands or other dry land lying within or to one side of the lines. The high seas on either side of the lines are not affected, however. One instance of this is the 1867 Convention which defines a line separating the territories in Alaska conveyed to the United States from those in Siberia remaining to Russia. Another more recent instance is the Italian Peace Treaty which defines lines within which certain islands in the Adriatic Sea are conveyed from Italy to Yugoslavia.

We hear much at the present time about claims advanced by different countries to the continental shelf adjacent to their shores. No doubt the time will come when it will be necessary to define limits through the high seas where the continental shelf of one country ends and that of an adjoining country begins. Such lines, like the lines of allocation, will probably not have the character of full international boundaries. When that time comes the cartographer may be faced with the necessity of inventing a new symbol to add to his already overburdened repertoire of boundary symbols.

❦ ❦ ❦

Flare Triangulation

A NEW, RAPID METHOD of extending control surveys to supply basic data for mapping and field artillery fire control by utilizing air stations has been successfully tested by the Engineer Research and Development Laboratories at Fort Belvoir, Va.

The project "Operation Flare" was conducted in cooperation with the Army Map Service, Washington, D. C., and the Engineer School, Fort Belvoir, Va. The purpose of the project was to test and evaluate several proposals for the utilization of airborne stations to eliminate the time-consuming conventional ground survey methods. This operation was called flare triangulation.

The airborne station—an airplane equipped with signal lights and flares—provides visual targets for accurate location by ground parties.

All the ground parties had theodolites equipped with cameras to photograph at any desired instant the horizontal angular reading of the instrument while tracking the airborne light or flare target. Simultaneous readings on the target from the six stations—three with fixed and known locations, the others at unknown locations—were photographed by tripping the camera shutters at the same instant by remote control in the plane.

By trigonometric computation the data from the known locations were extended to the unknown locations. The method can be repeated to the extent desired for control of maps and artillery fire.

The tests were conducted approximately 60 miles southwest of Washington, D. C., in an area east of Shenandoah National Park. Headquarters for the project were at Warrenton, Va.

Control Surveys in Alaska

By CAPT. ALBERT J. HOSKINSON
DIVISION OF GEODESY, UNITED STATES COAST AND GEODETIC SURVEY

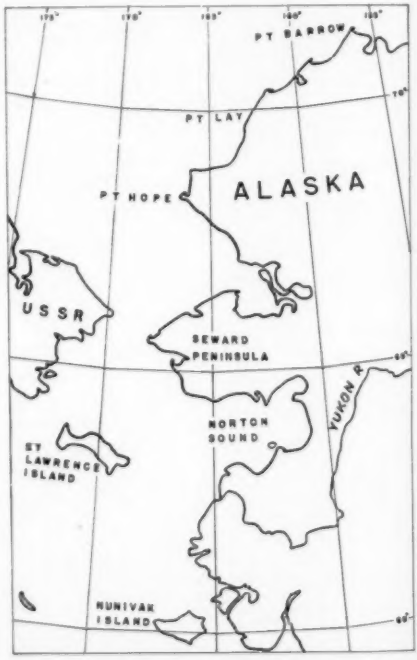
WE LIKE TO THINK of Alaska as the last great frontier of the United States, but this frontier, like the others that came before it, is slowly giving way to the march of civilization. The natural resources of this area are being developed and the land cleared and settled by homeseekers.

The pioneers of early America moved across continental United States in a steady stream and developed the country as they came. When the Pacific Ocean blocked their westward movement, they swung northward and started the development of the frozen northland. Progress in Alaska was very slow for many years because of the great difficulty in moving about the interior of that country. The development was greatly accelerated with the invention and perfection of the small airplane. This provided a means of rapid transportation in either winter or summer: in winter the plane was mounted on skis and in the summer on wheels or floats. Transportation has always been the key factor in the development of any area, and Alaska is certainly no exception to the rule, for as soon as transportation was available the development was greatly accelerated.

SURVEYS AND MAPS

Surveys and maps are among the principal tools in the successful and economical development of any area. Here again Alaska has been no exception to the rule. The demand for surveys and maps has increased from year to year until at the present time a sizable percentage of the Geodetic Survey personnel of the Coast and Geodetic Survey is engaged in surveying in Alaska each summer. This year there are five triangulation parties, one level party, and one astronomic party working in Alaska. This demand for surveys and maps may be expected to increase until the area is surveyed in sufficient detail to permit the economic development of the country.

This paper deals principally with the control surveys along the Bering Seashore from Point Lay south to the Alaska Peninsula, including the surveys of St. Lawrence and Nunivak Islands and some of the river basins adjacent to the coast. The surveys north of Point Lay and along the Arctic coast are not included here because that area requires somewhat different techniques, and discussion of those methods can best be described in a separate paper at some later date.



Presented at the Eleventh Annual Meeting, American Congress on Surveying and Mapping, Washington, D. C., June 18–20, 1951.

METHODS OF SURVEY

The area under consideration required very little change in the methods so successfully used in executing control surveys in continental United States. The accuracy requirements were slightly relaxed to allow greater progress. Modified second-order (something not quite as good as first-order but better than second-order) was selected for the Alaskan surveys.

A triangulation party in the United States operates from a central camp to which personnel return each day. The building units erect the towers and stands required at each station in advance of the observing program. The observers and assistants then follow with the observing program, sending lightkeepers to those stations being observed. In Alaska, where transportation is a more serious problem and where weather conditions change very rapidly, a somewhat different technique has been adopted and has proved quite successful. The building material is delivered directly to the station site by airplane, generally without landing the airplane. The observer and one or more assistants are then flown to the station with their instruments and camp equipment. They camp at the station until the building and observing programs are completed, when they are moved directly to another station site and repeat the program. At least six observing parties are needed in order to operate efficiently in this manner. This method saves considerable transportation and provides for very rapid progress because the observer is always at his station and can take advantage of any clear weather interval. It has the disadvantage of requiring more trained observers and more theodolites. It also forces the employees to live a more isolated life, for they camp with one or more companions for long periods of time at isolated places.

TRANSPORTATION

Transportation is always one of the prime considerations in control surveys. It was quickly determined that the airplane was the only satisfactory means of transportation in this region. Four to six small planes provide sufficient transportation for a survey party of 25 men. The planes have, in recent years, been secured on a contract basis, payment being made for the number of hours of flying time during the season. It has generally been necessary to give a minimum guarantee regarding the number of flying hours. Small cub planes similar to the PA-18 have given the best service in Alaska areas. They are mounted on floats or wheels as required during the season. The tandem-wheel type has proved the most successful for landing on rough terrain.

The helicopter type of plane is almost a necessity in certain areas and has been used to good advantage in recent years. It is, however, very expensive compared to the fixed wing plane and has therefore been used by the Coast and Geodetic Survey only in those areas were other planes could not work satisfactorily. Fortunately most of the area along the Bering Sea has numerous small lakes where float type planes can land. Our experience with the helicopters indicates that it is best to have at least two with each isolated survey party so that a temporary breakdown of one plane will not leave some of the personnel stranded in isolated places.

PERSONNEL

The personnel for Alaska duty is more carefully selected than for work in the United States. Medical attention is more difficult to obtain in that area. One or two men must frequently spend several days alone camped out in isolated places. Everyone must know his job well so that when weather conditions permit, the greatest progress can be made, and during periods of unfavorable weather all personnel can be gainfully employed on field computations and related duties. In order to take advantage of observing weather at any time, a 56-hour work week

is approved for Alaska parties, and this increased pay is an incentive for competent employees to volunteer for Alaska duty. Personnel for the Alaska parties are selected from volunteers at the start of each season.

INSTRUMENTS

There has been little change in the instrumental equipment, except to winterize all instruments so that observations may be made at lower temperatures than in the United States. The Wild T-3 theodolite, because of its lighter weight, is a most satisfactory instrument for Alaska duty. Every pound saved is well worth while when transportation is by airplane.

STATION MARKS

The conventional method of marking stations with a bronze disk placed in a concrete monument is not satisfactory in most of the Alaska terrain. The standard bronze disk welded to a length of pipe has proved to be a better type of mark. The pipe has a flange on the lower end and is placed so that this flange is always in the permafrost zone, thus insuring that the mark will remain undisturbed during the winter and summer seasons. The length of pipe required is determined by the depth to the permafrost during the summer months.

CAMPING EQUIPMENT

The survey parties must camp out in isolated places and must therefore be provided with shelter from the elements and insects of the region. We have adopted the 9- by 9-foot center-pole, or pyramidal tent, as the most satisfactory for the region. Mosquito-proofed white canvas tents with a good floor tarpaulin are standard equipment. A standard canvas folding cot and an Aretic sleeping bag are likewise standard equipment. Gasoline stoves are used for heating and cooking purposes. Canned and dried foods form the major part of the rations for an Alaska party.

ASTRONOMIC OBSERVATIONS

Astronomic observations for latitude, longitude, and azimuth are, of course, an essential part of control surveys. In the United States or the lower latitudes the azimuth observations are usually made by the triangulation party and the latitude and longitude observed at a later date by the astronomic party, using a Bamberg transit for these observations. This system must be changed in Alaska because the theodolite used in the triangulation observations is not a satisfactory instrument for azimuth observations in the higher latitudes. For several years the Bamberg transit was used for this work, the observations being made with the micrometer eyepiece. This method, of course, required that the station used as the azimuth mark be located very nearly in the azimuth of Polaris at elongation. Last year the Wild T-4 universal insfrument was used for the azimuth work, and indications are that it will be a most satisfactory instrument for this work and will eliminate the necessity of placing the azimuth station in a fixed direction and will permit observations to be made whenever Polaris is visible.

One of the major difficulties of astronomic observations in Alaska is the lack of darkness during the summer months and the intense cold during the winter months. The most satisfactory solution so far has been to make the observations in the spring and fall months when the cold is not too severe and when there is sufficient darkness to permit a satisfactory observing program.

The Natchez Trace was a road running more than 500 miles from Nashville, Tenn., to Natchez on the Mississippi River. It followed roughly an old Indian trail. In Nashville on West End Avenue facing Centennial Park is the junction of the Natchez Trace and Old Wilderness road.

Surveying and Mapping News

Members are requested to send in surveying and mapping news items for publication in SURVEYING AND MAPPING—EDITOR.

CURRENT SURVEYING AND MAPPING LITERATURE

MAGAZINE ARTICLES

MAPS. Walter W. Ristow and Staff of the Map Division. *The Library of Congress Quarterly Journal*, August 1951. (Report of map accessions during 1950.)

LEWIS EVANS' EARLY AMERICAN NOTICE OF ISOSTACY. George W. White, Department of Geology, University of Illinois, Urbana. *Science*, Vol. 114, No. 2960, September 21, 1951. (Quotes from the journal of the famous early American cartographer.)

AN ACCOUNT OF THE SIMPLIFIED METHODS OF MAPPING FROM TRIMETROGON PHOTOGRAPHS USED IN THE ANGLO-EGYPTIAN SUDAN. J. W. Wright. *Photogrammetric Engineering*, September 1951.

THE FIRST ENGLISH GLOBE: A RECENT DISCOVERY. Helen M. Wallis, *Geographical Journal*, Vol. CXVII, Part 3, September 1951. (Illustrated description of a terrestrial globe of 1592 by Emery Molyneux, first English globe-maker.)

THE PANTOGRAPH. *The New Zealand Survey Draughtsmen's Journal*, September 1951. (Description of the theory and operation of the suspended pantograph.)

SITES FOR PASSAMAQUODDY BAY DAMS EXPLORED WITH NEW SOUNDING TOOL. *Engineering News-Record*, Vol. 147, No. 17, October 25, 1951. (Tells of results obtained by U. S. Geological Survey using a Navy sonic sounding device.)

DEVICE INTERPRETS AERIAL PHOTOGRAPHS. *Cado-Technical Data Digest*, October 1951. Central Air Documents Office, Dayton, Ohio. (Describes a simple device which accurately gives true horizontal directions from oblique aerial photographs.)

EARLY CHARTS AND THE ORIGIN OF THE COMPASS ROSE. E. G. R. Taylor. *Journal of the Institute of Navigation*, Vol. 4, No. 4, October 1951. (Maps.) (A historical account of the development of the magnetic compass and its portrayal on nautical charts by European mariners.)

SUBMARINE GEOLOGY OF THE GULF OF ALASKA. Henry W. Menard and Robert S. Dietz. *Bulletin of the Geological Society of America*, October 1951. (An elaboration of the pioneering work by Murray in contouring the Aleutian Trench and Gulf of Alaska.)

THE WORLD-WIDE GRAVITY PROGRAM OF THE MAPPING AND CHARTING RESEARCH LABORATORY OF OHIO STATE UNIVERSITY. W. Heiskanen. *Geophysics*, Vol. 16, No. 4, October 1951. (A discussion of the geodetic applications of the gravity method.)

PLUMB BOB POINTS. G. G. McGinness. *California Highways and Public Works*, Vol. 30, Nos. 11, 12, November–December 1951. Illustrated. (Discusses the importance of standardization of plumb bob points to the engineering profession.)

PHOTOGRAMMETRY. L. L. Funk. *California Highways and Public Works*, Vol. 30, Nos. 11, 12, November–December 1951. (This article, based on a paper given by Mr. Funk at the semiannual meeting of the American Society of Photogrammetry at Sacramento, October 19, 1951, describes the use of photogrammetric mapping in connection with various California highway projects.)

FEDERAL RECRUITMENT OF JUNIOR ENGINEERS. George P. Bush and Lowell H. Hattery. *Science*, Vol. 114, No. 2966, November 2, 1951. (Describes analysis of 600 questionnaires filled out by engineering school graduates giving their opinions of the relative advantages of federal and private industrial employment. Employment in industry was overwhelmingly favored. "Substantial changes in policy, procedure, and public relations are in order if federal agencies are to be in a favorable competitive position to obtain young engineering talent.")

HOW GOOD IS FLOOD CONTROL? Gerard H. Matthes, Consulting Engineer. *Engineering News-Record*, Vol. 147, No. 19, November 8, 1951. (Questions efficacy of usual methods of flood control and the real need for costly preventive measures.)

NEW OPTICAL TRANSIT HAS EVERYTHING. James M. Connolly. *Engineering News-Record*, Vol. 147, No. 21, November 22, 1951. (Describes new Italian-made transit which incorporates ideas of American users and is manufactured by Filotechnia Salmoiraghi S.p.A. in Milan.)

COOPERATIVE PROJECT INCREASES USEFULNESS OF COOPER UNION'S SURVEY-

ING CAMP. John O. Eichler, Associate Professor of Civil Engineering, and Giles G. Green, Assistant Professor of Civil Engineering, The Cooper Union, New York, N. Y. *Civil Engineering*, Vol. 21, No. 11, November 1951. (Illustrated account of construction of concrete dam and footbridge by students.)

ENGINEERS CALLED ON TO DEFEND COMPETITIVE ECONOMY AND INDIVIDUAL INITIATIVE. Carlton S. Proctor, President of ASCE. *Civil Engineering*, Vol. 21, No. 11, November 1951. (President's Inaugural Address at 99th Annual Convention of ASCE.)

HUMAN NAVIGATOR OR BLACK BOY. Alton B. Moody. *The Ensign*, November 1951. (Emphasizes the necessity of adequate training in using modern electronic methods of navigation.)

THE MARINE GEOLOGY OF THE SAN NICOLAS ISLAND REGION, CALIFORNIA. Robert M. Norris. *Scripps Institution of Oceanography*. November 1951. 18 pages. (Submarine Geology Report No. 21.)

CHARTING LAND AND SEA. *All Hands*, December 1951. (An illustrated discussion of work of Coast and Geodetic Survey. The first of a series of articles on services and activities of various Federal agencies.)

GEOGRAPHIC WORK OF ARNOLD GUYOT (Abstract). Robert L. Anstey. *Bulletin of the Geological Society of America*, Vol. 62, No. 12, Part 2, December 1951. ("... Guyot greatly extended the westward limit of hypsometric mapping in the United States. He determined the heights and toponomy of peaks and valleys throughout the Appalachian mountain system and elsewhere. These data and maps served as bases for both military maps used in the War between the States and for later topographic sheets. . . . He directed the preparation of several of the earliest sets of atlases and wall maps on which major differences in relief were shown by color . . . a system still used. . . . These maps are remarkable both for their innovations and attention to detail.")

PROBLEMS OF ALLUVIAL-TERRACE MAPPING FOR THE ENGINEERING GEOLOGIST. (Abstract.) Alvin R. Leonard and John C. Frye. *Bulletin of the Geological Society of America*, Vol. 62, No. 12, Part 2, December 1951. ("Terraces are commonly mapped by physiographic form but interpreted for engineering use in terms of underlying deposits. This hybridization of physiography and stratigraphy has led to inconsistency of mapping . . . for data to be of engineering value a map symbol should reflect similarities at depth.")

RESUME OF AERIAL TRIANGULATION ADJUSTMENT AT THE ARMY MAP SERVICE. Robert S. Brandt. *Photogrammetric Engineering*, Vol. XVII, No. 5, December 1951. (Presents some of the adjustment procedures which have been tested by the AMS and the results obtained.)

SYMPOSIUM: AIR PHOTOS IN GEOGRAPHY AND SOIL SCIENCE. Compiled by Professor H. T. U. Smith. *Photogrammetric Engineering*, Vol. XVII, No. 5, December 1951. (This symposium, of interest to map makers and engineers in general, includes an introduction by Professor Smith and the following papers: "Some Applications of Aerial Photographs to Geographic Studies in the Gulf Coast Region," Ben A. Tator; "Use of Aerial Photography for Indiana Land Use Studies," T. M. Bushnell; "Use of Air Photos for Soil Classification and Mapping in the Field," John D. Rourke and Morris E. Austin; "Use of Aerial Photographs in the Publication of Soil Maps," H. W. Whitlock and D. W. Crook; "Geographical Air - Photo - Interpretation," Kirk H. Stone; "The Use of Aerial Photographs in the Geographical Analysis of Rural Settlements," Clyde F. Kohn; "Some Aspects of the Field Use of Aerial Photographs by Geographers," Fred W. Foster; and "A Key for the Photo Identification of Glacial Land Forms," William E. Powers.

THE USE OF AIR PHOTOS FOR LANDFORM MAPS. Erwin Raisz. *Annals of the Association of American Geographers*, Vol. XLI, No. 4, December 1951. Illustrations and tables. (Reports on the adaptability of aerial photographs to the construction of landform maps, or physiographic diagrams. The author presents a convincing case in regard to the purposes of landform maps.)

FUTURE ENGINEERING OPPORTUNITIES FOR YOUNG MEN AND WOMEN. C. L. Eckel, Dean, College of Engineering, University of Colorado. *The Engineers' Bulletin*, Vol. 36, No. 2, February 1952. (Reviews the contribution of the engineering profession to the immense development of the country and foresees an unprecedented demand for engineers in the future.)

BOOKS AND PAMPHLETS

CONTRIBUTIONS TO ASTRONOMICAL GEODESY. Publication 12 of the *Land Survey Office*. Bamberg, Germany. 1950. 166 pages. Formulas, diagrams, and tables. (In German with table of contents and abstract in English.)

RIGOROUS ADJUSTMENT OF LARGE ASTRONOMIC-GEODETIC NETS WITH STEP-BY-STEP APPROXIMATION. Publication 7 of the *Land Survey Office*. Bamberg, Germany. 1950. 123 pages. Formulas, diagrams, and 20 tables. (In German with abstract in English.)

GELANDE UND KARTE. Eduard Imhof. *Erlenbach-Zurich: Eugen Rentsch Verlag*, 1950. 256 pages, maps, diagrams, and illustrations. 42s. (A book for the general map user, this volume has as its purposes to spread an understanding of maps with "an eye for country" and to explain the system and content of the National Map of Switzerland.)

SURVEY OF INDIA, TECHNICAL REPORT 1950. PART III—GEODETIC WORK. Published by *Order of the Surveyor General of India*. xi and 127 pages. 25 plates. 26 charts, tables.

U. S. RAILROADS: CLASSIFIED ACCORDING TO CAPACITY AND RELATIVE IMPORTANCE. Edward L. Ullman. Two-color map, 30½ × 44 inches. *Simmons-Boardman Publishing Corporation*, 30 Church Street, New York, N. Y. 1950. $2.50. (Enlargement of a map accompanying the author's article "The Railroad Pattern of the United States" published in the April 1949 issue of the *Geographical Review*.)

ARCHITECTURAL GRAPHIC STANDARDS. Charles George Ramsey and Harold Reeve Sleeper. *John Wiley and Sons, Inc.*, New York. 1951. 4th Edition, 614 pages, illustrations. $10.00. (Standard reference work for draftsmen, decorators, and builders, but more particularly for architects and engineers.)

COASTAL ENGINEERING. *University of California*, Berkeley. 1951. 334 pages. $4.50. (Proceedings of the First Conference on Coastal Engineering, sponsored by Council on Wave Research.)

MID-CENTURY ALASKA. Office of Territories, Department of the Interior. *Government Printing Office*, Washington, D. C. 1951. 155 pages. 75 cents. (A reference source of general information on Alaska.)

PREPARING TECHNICAL MATERIAL FOR PUBLICATION: A MANUAL FOR AUTHORS OF COLLEGE AND STATION PUBLICATIONS. Lisle A. Rose, Elmer F. Heater, and George F. Foster. *University of Illinois*. 1951. 39 pages. 60 cents. (A style book for technical authors.)

REPORT OF CONFERENCE OF BRITISH COMMONWEALTH AND U. S. A. SURVEY AUTHORITIES HELD IN WELLINGTON, NEW ZEALAND, NOVEMBER, 1950. 26 pages. 1951. (General report on the conference with summary of papers and discussions. Photograph of delegates. American Congress on Surveying and Mapping was represented by Mr. Earl G. Harrington of the Bureau of Land Management.)

REVIEW QUESTIONS FOR SURVEYORS. Professor Russell C. Brinker. *Virginia Polytechnic Institute*, Blacksburg, Virginia. 1951. 109 pages. $2.00. (Contains discussions of 1575 surveying questions gathered by author over period of 20 years.)

STRUCTURAL GEOLOGY OF NORTH AMERICA. A. J. Eardley. *Harper*, New York. 1951. 624 pages. $12.50. (Describes the structural evolution of the North American Continent in post-Proterozoic time.)

HIGH, WIDE AND DEEP. John J. Floherty. *J. B. Lippincott Company*, Philadelphia and New York. 1952. First Edition. 171 pages. Illustrations. $2.75. (Science and adventure with the Coast and Geodetic Survey.)

—LYMAN D. LYNN

DISTINCTIVE RECENT MAPS

An interesting group of Turkish maps published in 1951 show the influence of United States technical assistance on the improvement of transportation and communication in Turkey. Included are:

Mülki Idare Taksimati [Civil Administrative Divisions of Turkey]. Published by Harta Genel Müdürlügü, 1951. Colored. 14 by 31 inches. 1: 2,200,000. Shows minor civil divisions and several classes of roads and railroads. Variants in place-names are shown in parentheses and smaller type next to the accepted name.

Devlet Demiryollari Hartasi [Railroads of Turkey] *1950*. Published by Devlet Demiryollari Genel Müdür [General Directorate of Railroads]. Colored. 14 by 23 inches. 1: 3,200,000. In Turkish. Three classes of cities and towns are shown in addition to railroads. Relief is indicated by plastic shading.

Traffic Flow Map (of Turkey) *Fall, 1950*. Published by General Directorate of Highways, Planning & Programming Division [Karayollari Genel Müdürlügü] 1951. Colored. 11 by 27 inches. 1: 2,700,000. In Turkish and English. Shows three categories: "Carts and Wagons, Trucks and Buses, and Automobiles." A marginal graph gives "Scale of Daily Average Number of Vehicles."

Map Showing Types of Roads and Parts Passable During Different Seasons [Turkey]. Prepared by the General Directorate of Highways and by the General Directorate of Geodetic Survey, 1950. Colored. 13 by 27 inches. 1: 2,500,000. In both English and Turkish. A physical map with layer coloring on which several classes of roads and railroads are overprinted. Also shown are monuments, ruins, and filling stations. Distance in kilometers between junctions are

given. On verso: index to cities, table of distances, table of monuments and historic ruins, Road Distance Map 1: 10,000,000, seven photographs of famous scenes, Ankara (and vicinity) 1: 35,000, Ismir 1: 200,000, and Marmara Denizi 1: 200,000.

Devlet Yollari Kontrol Kesimleri Haritasi [State road control system map]. Published by Karayollari Genel Müdürlügü, December 1951. Printed by Harta Genel Müdürlügü. 12 by 29 inches. 1: 2,500,000. Shows 10 administrative divisions (with subsections) of the highway network. Numbered control points are noted.

1950 Annual Daily Average—Motor Vehicles, Carts and Wagons, Flow Map. Published by General Directorate of Highways, Planning and Programming Division, 1951. Colored. 12 by 29 inches. 1: 2,500,000. In English and Turkish. A road map showing the flow of traffic by number (red for motor vehicles; blue for carts and wagons).

Electrification Plan of Turkey (1st stage). Map showing the principal electric power plants and power transmission lines whose projects have been prepared by the Electrical Research Administration. 1951. Printed by the General Directorate of Geodetic Survey. Colored. 13 by 27 inches. 1: 2,500,000. Two editions: one English and one Turkish. Shows power plants and transmission lines in operation and under construction and projected. On verso: text describing 19 projects of the "Electrification Plan of Turkey (1st stage)."

Türkiye Su Hartasi [Water Map of Turkey]. Published by Bayindirlik Bakanlik [Ministry of Construction] and printed by Harta Genel Müdürlügü. 1951. Colored. 14 by 30 inches. 1: 2,250,000. In Turkish. Distinguishes between large and small water projects. Under the former are shown irrigation, reclamation, and river basin or catchment area projects. Under the latter are three categories: completed or being completed, irrigation, and drainage and reclamation. On verso: text and statistics.

The World Map. National Geographic Society. December 1951. Colored. 27 by 41 inches. 1: 40,000,000. Van der Grinten's projection. Shows principal roads, railways and airports, ocean currents, and elevations and depths in feet. Main political divisions are shown by contrasting colors. Insets show the United Nations, the International Time Zones, and north and south polar projections. A 27-page index is keyed to 5,488 place names on the map.

North America. National Geographic Society. March 1952. Colored. 35 by 28 inches. 1: 11,000,000. Chamberlin Trimetric Projection. Shows principal roads, railroads and airports, passes, ruins, and elevations in feet. A marginal table gives geographic equivalents in English and native tongues and abbreviations. Insets show (*a*) Bering Sea and the Aleutian Islands and (*b*) the Diomede Islands. A separate index lists 5,204 place names.

Distribution of Helminthiases (Atlas of Distribution of Diseases, Plate 4). American Geographical Society, New York. 1952. Colored. 25 by 38 inches. 1: 50,000,000. Briesemeister Elliptical Equal-Area Projection. Several maps share the sheet, the largest of which is entitled "Worms Acquired Through Lack of Protection of Body from Contact with Excreta-Established Infestation." Four other maps, large insets with smaller insets, show "Worms Acquired by Ingestion, Life Cycle With More Than One Host"; "Worms Acquired by Ingestion, Life Cycle Without Intermediate Hosts"; "Worms Transmitted by the Bite of an Insect"; and "Worms Acquired by Skin Penetration." A résumé of the epidemiology appears in table form. On verso: extensive bibliography. A detailed explanation of the map appears in *The Geographical Review*, Vol. 42, No. 1, January 1952, pp. 98–101.

Demographic (basic) Map of the United Kingdom Showing Distribution of Population by Local Government & Parliamentary Electorates as of October 25, 1951. Drawn by Norman Killingray. Copyright: Neighborhood Map Co., Ltd., Dunstable. 43 by 33 inches. 1: 1,000,000. An extremely detailed administrative map with numerous insets showing "divided boroughs." The many place names give a congested appearance.

General Drafting Co., Inc. *Map Showing Cotton Growing Regions of the United States and Mexico*, designed exclusively for Geo. H. McFadden & Bro., New York, c1951. Colored. 26 by 38 inches. 1: 4,700,000. Shows four major belts, offices and agencies of the company, spot markets (USDA), and delivery points for future contracts. Inset, "The cotton belt in relation to the United States," shows limits of growing areas and dates (lines) of earliest autumn crop-killing frost.

California. Division of Mines. *Shaded Relief Map of California.* (Bulletin 158, Plate I.) Chief artist, Hal Shelton. Jeppesen & Co., Denver, c1951. Colored. 24 by 22 inches. 1: 2,000,000. "Prepared by a special technique of shading a topographic map, scale 1: 1,000,000, in color, and reducing it photographically to the scale 1: 2,000,000." Inset: Map of California showing natural provinces [major geologic units].

Geomorphogenic Regions of the Negev by L. Picard. 1950. Red overprint on base sheet titled: *Israel (South)* 1: 250,000. Reprinted by Survey of Israel, 1951. 40 by 25 inches. Shows 14 geomorphogenic regions, the Sanai-Hamth anticlinal uplift, crystalline Negev, watershed line, high-plains of "dead" drainage, and arrows indicating the anticlinal axis.

Geological Map of India. 1949. Published under the direction of W. D. West, Director, Geological Survey of India. Colored. 25 by 30 inches. 1: 6,200,000. Printed at Survey of India Offices. Shows 16 different formations in Peninsular India and 17 in "Himalaya, Burma and Portions of Assam" by means of colors and symbols. Includes Pakistan and Burma.

Feature Map of the Australian Capital Territory and Environs. Compiled and drawn under the supervision of L. Edwards, Chief Draftsman, Survey Branch, Engineers Dept., F.C.C. Canberra, 1929, revised 1950. L. F. Johnston, Commonwealth Government Printer, Canberra, 1950. Colored. 36 by 28 inches. 1: 125,000. Shows roads, railroads, distances, post and telegraph offices, district boundaries, spot heights, and possible landing grounds. Mountains are shown by modified hachures.

Belgium. Ministere des Colonies. Commission de Géologie. *Carte Géologique du Congo Belge et du Ruanda-Urundi,* prepared by L. Cahen et J. Lepersonne. Brussels, Institut Géographique Militaire. 1951. Colored. Four sheets, each 28 by 28 inches. 1: 2,000,000. In French and Flemish. Distinguishes 54 different geological formations by colors and symbols.

Raisz, Erwin. *Landforms of the Near East.* Prepared at the Institute of Geographical Exploration, Harvard University, Cambridge, Mass. 1951. Monochrome. 22 by 30 inches. 1:3,000,000. "This map is based primarily on trimetrogon airplane photographs and actual air reconnaissance. Roads, rivers, etc., were laid out according to the U.S.A.F. Aeronautical Charts. The British ¼-mile sheets of Iraq and Jordan, the geological and topographic maps of various scales of Egypt, and the lithographic maps of Dubertret of Syria and Lebanon were also consulted. Turkey is based chiefly on the 1: 200,000 British and 1:800,000 Turkish topographic, geologic and tectonic series." Base map prepared for the Environmental Protection Section. Office of the Quartermaster General. The following forms are shown and defined: wadiyan, harrat, hajara, shallow, karst, hummocky limestone, mountains of bedded rocks, massive mountains, and fans. Insets show landform regions, political divisions, and "reliability."

Raisz, Erwin. *Landforms of Arabia.* Prepared for the Environmental Protection Section of the Office of the Quartermaster General, Institute of Geographical Exploration, Harvard University, Cambridge, Mass. 1951. Black and white. 27 by 30 inches. 1: 3,500,000. "This map is based primarily on trimetrogon airplane photographs and actual air reconnaissance. Roads, rivers, etc., were laid out according to the A.A.F. Aeronautical Charts. The American-Arabian Oil Co. helped generously with maps and advice. Reports of explorers such as Philby, Musil, B. Thomas, Little, Lees, Twitchell, Thesiger, and many others were consulted. The 1: 253,440 British maps of Iraq and Transjordan, the 1: 200,000 Levant series, and the lithologic maps of Dubertret were used in the northern parts." The margin contains a block diagram, a glossary, a list of abbreviations used, and a legend defining the various landforms. Insets show landform regions (outline), political divisions, and reliability (good and poor).

Hoy, Harry E. *East Central Asia.* Base map prepared for Environmental Protection Section, Research & Development Branch, Office of Quartermaster General. July 1950. Lithographed by AMS 6-51. Colored. 32 by 30 inches. 1: 3,500,000. A physical map showing landforms in brown and blue; boundaries, roads, and railroads in black. Similar to maps prepared by Raisz.

Map of the Oriental Tobacco Regions. Published by N. V. Hollandsch-Turksche Tabak Maatschappij, Rotterdam. Colored. 26 by 50 inches. 1: 2,000,000. Designed by J. H. Kammann, Izmir. Printed by Arps and Zoon, Rotterdam. Shows the lower Balkan states and the area eastward to Iran and Iraq. Inset shows the Russian Oriental Tobacco Regions. Unfortunately there is no description of the different regions.

Port of London Authority. *Port of London,* the River Thames from Teddington to the Nore, 1: 85,000; and *Plan of the Docks,* showing road access, rail connections, ships berths, warehouses, transit sheds, dock offices, etc., 1: 15,000. Two colored maps on sheet 29 by 44 inches. 1951. A mass of detail is given here. Based on Ordnance Survey maps.

(Map of) *The Norfolk Broads and Rivers* (England) by Edward Stanford, Ltd., London, 1951. ca. 1: 43,000. Colored. 35 by 30 inches. Presenting a very interesting transportation pattern showing roads, railroads, and waterways. Also shown are post and telegraph offices, marshes, parks, churches, inns, boat houses, drainage pumps, and windmills. Early closing days and level crossings are indicated. Regulations for sailing are printed in the margin. Based on Ordnance Survey map.

Map of Delaware County, N. Y. Highway System, 1950. Malcolm MacPherson, County Superintendent of Highways, Delhi, N. Y. "Copyright 1950 by W. P. Munger, Binghamton, N. Y." Colored. 26 by 28 inches. 1: 128,000. Shows internal county subdivisions by contrasting colors; state and county roads, proposed and completed; railroads, and incorporated places.

Ballert, Albert G. *The Major Ports of the Great Lakes, Tonnage and Principal Traffic in 1948.* (Toledo, Ohio) c1951. Black and white.

1: 1,800,000. 30 by 22 inches. Pairs of tonnage symbols indicate receipts and shipments of millions of short tons of coal, cement, grain, iron ore, iron and steel, petroleum and products, sand and gravel, stone, and car ferries.

The Geographical Press, Columbia University. *Physiographic Diagram of Australia,* drawn by A. K. Lobeck to accompany text; description and geological sections were prepared by Joseph Gentilli and R. W. Fairbridge of the University of Western Australia. New York, c1951. Black and white. 19 by 24 inches. 1: 7,500,000. Explanatory text on verso and accompanying sheet. The margin lists 41 physiographic regions under three main headings: I. West Australian Shield, II. East Australian Basins, III. East Australian Cordillera. Inset shows Tasmania. A scholarly work. "To American students the detailed description presented here will seem formidable, largely because of the many unfamiliar and sometimes unpronounceable names. These names . . . have been put on the Diagram."

The January–March 1952 issue of SURVEYING AND MAPPING contains a description of the first four published sheets of the *Weltforstatlas.* Of the 50 sheets to be issued, four more have appeared and are as follows:

General View of the Forest Distribution in Europe. 1951. Colored. 1: 8,000,000. 24 by 30 inches. Shows tundra, fjeld, forest-tundra, unproductive forests, and forests. "For the Mediterranean countries: forest areas, including macchai and scrub."

General View on the Percentages of Forests in Europe. 1951. Colored. 24 by 30 inches. 1: 8,000,000.

General View on the Percentage of Forests in Finland, Sweden, and Norway. 1951. Colored. 30 by 24 inches. 1: 3,000,000.

General View on the Forest Distribution in Turkey and Greece. 1951. Colored. Two maps on one sheet 24 by 30 inches. 1: 3,000,000 and 1: 2,000,000, respectively. Shows forest and scrub.

A group of maps published in 1951 by the Ministere des Travaux Publics, des Transports et du Tourisme are designed to attract the voyager to France or to ornament the home of the armchair traveler. Included are maps of each province approximately 17 by 21 inches and varying from 1: 400,000 to 1: 800,000. The verso of each gives local scenes and descriptions. A general information pamphlet accompanies each map.

Another map in the group entitled *Sanctuaries and Pilgrimages* (18 by 21 inches, 1: 3,400,000) shows Romanesque, Gothic and modern churches and shrines and indicates six different pilgrimage routes with variants. Pictures and text appear on the verso.

Another, *French Chateaux: A Map* (24 by 24 inches; 1: 1,400,000) shows four classes of chateaux: "medieval ruins and monuments, Renaissance buildings, XVIIth Century edifices, and XVIIIth Century monuments." The verso contains an index, two views and two small maps "Chateaux in the Ile-de-France" and "Chateaux Along the Loire."

Map of French Seaside Resorts (*Coasts of France*), 12 by 12 inches on sheet 17 by 21 inches, locates vacation spots on the scale 1: 7,000,000. A descriptive text with photographs was issued with the map.

Companion pieces to these official French maps are two published by Girard, Barrère et Thomas in 1951. *Carte Gastronomique et Vinicole de la France* (1: 1,330,000, 32 by 32 inches) by A. Bourguignon, "ex-chef de cuisine, directeur de l'Ecu de France" will tempt the poorest appetite as well as the heartiest gourmet. In addition to the well-known vineyards the homes of such famous dishes as lapin sauté, les foies gras, and bouillabaisse are shown.

Marques Symboliques des Départements . . . (ca. 1: 3,000,000, 21 by 23 inches) by Robert Louis is an attractive pictorial map showing the various departéments, each with its heraldic shield.

—WALTER W. RISTOW
—MARIE C. GOODMAN

ALIDADE SERVICE BOOKLET

TO AID ENGINEERS in the field in the use and adjustment of alidades, a new 28-page pocket-size service booklet has been published by W. & L. E. Gurley, Troy, N. Y., 107-year-old manufacturer of engineering instruments.

Helpful information for use of the alidade in both exploration and map making, as well as detailed instructions on stadia surveying and the use of the Beaman Stadia Arc are included in Service Booklet "C."

The second half of the "C" booklet deals with alidade adjustments, and includes sections on Parallax, Striding Level, Cross-Level Rectification, Collimation, Control Level, Gradienter, Circular Level, Compass Needle, Finder Sights, and Beaman Stadia Arc Index.

Free copies of the booklet may be obtained by writing W. & L. E. Gurley, Troy, N. Y.

Books in Review

PLANE TABLE MAPPING. Julian W. Low. *Harper & Brothers,* New York. 1952. 365 pages. $4.50.

THIS IS THE MOST COMPREHENSIVE TREATISE on planetable mapping that has been published in the United States. The agencies of the Federal Government engaged in surveying and topographic mapping have, from time to time, published instruction manuals giving considerable information on the use of the planetable as applied to their particular operations, but as a rule these manuals fail to cover the minor details of operation that are so helpful to the beginner or to those who have but infrequent opportunities to use the planetable.

Many experienced planetable operators will disagree with the author on a few of the detailed procedures described, but this in no way detracts from the value of the book, as these details are often matters of personal preference. The point to consider is that, if the book is followed, a beginner with the necessary aptitude will find it an invaluable guide toward proficiency in planetable technique.

It is unfortunate that a few factual errors are to be found in the book. On page 169 there appears a statement that "a number of the larger cities have been mapped by the U. S. Geological Survey on a scale of 1:2400 and a contour interval of 2 feet." This is a serious misstatement. The usual publication scale for Geological Survey quadrangle maps that include city areas is 1:24,000 or one inch equals 2,000 feet. The contour intervals ordinarily used for this scale range from 5 to 40 feet depending on the relief of the terrain. On one WPA mapping project carried out by a western city during the 1930's, where a larger scale and smaller contour interval were used, the Survey assigned a few engineers to assist in the technical supervision and some of this mapping was later incorporated in standard quadrangle maps for publication, first at 1:31,680 scale and reprinted at 1:24,000 scale.

Of less serious import except to raise a question as to the care exercised in checking factual statements is a sentence found on page 138 which reads, in part, "At latitude 50° north (the northern boundary of the United States) . . ." This will undoubtedly interest our Canadian neighbors who at present live north of the 49th parallel but south of the 50th.

This book should find wide acceptance among geologists and engineers who are confronted with surveying and mapping problems, for while it has a few faults of a minor nature, it is a major contribution in explaining an art that is often neither fully appreciated nor fully utilized.

C. H. DAVEY

U. S. Geological Survey

PRACTICAL PHOTOGRAMMETRY. H. O. Sharp. *The Macmillan Company,* N. Y. 229 pages.

THE AUTHOR'S PRAISEWORTHY OBJECTIVE as stated in his preface was to write a book suitable for use both as an instruction manual for practicing engineers and as a textbook for courses in photogrammetry. Attainment of this dual objective in a pocket-size volume covering a field as broad as photogrammetry presents a challenge to the technical writer. Meeting this challenge requires close attention to such characteristics of good technical writing as selection and organization of material, proper placement of emphasis, concise expression, correct terminology, and the balance between descriptive and diagrammatic presentation.

Professor Sharp has organized his material in "Practical Photogrammetry" in a way well-suited to the needs of the practicing engineer whose training and experience do not embrace photogrammetry. Fundamentals are covered in Part I and the practical applications are outlined in Part II. If the other characteristics of sound technical writing are not always in evidence to a degree commensurate with the condensed format of the book, the deficiency is not sufficient to detract from its value to the engineer who must learn to recognize the applicability of photogrammetric

techniques to his surveying problems but who leaves execution to the photogrammetrist.

The rudiments of the subject are introduced in Part I by a brief history. Mention of Wheatstone and Brewster in this section would have been appropriate, for their invention, the stereoscope, is later described as the one instrument most important to the photogrammetrist. The fundamentals are then developed through a consideration of the following topics: the camera, perspective characteristics of the photograph, basic principles of terrestrial and aerial photogrammetry, stereoscopy, classification of maps, control surveys, and map compilation procedures as related to stereoscopic plotting instruments.

Limiting to 100 pages the presentation of subject matter so broad in scope requires the author to guard against misplaced emphasis. His guard is down when he devotes pages of description to obsolete stereoscopic plotting instruments while others currently used to produce work of the highest order are dismissed with a paragraph or are not mentioned.

The enumerative method of listing the steps in a given photogrammetric procedure is employed throughout the text and serves to fulfill the requirements of a manual. Part II demonstrates the principles of applied photogrammetry by enumerating a series of projects based either on accomplished fact or on hypothetical data. These practical applications present the solution of problems involving the use of the stereoscope, the determination of ground elevations by parallax measurements, flight-map preparation, highway planning, tax-map compilation, rectification, and soil and land surveying by photogrammetric methods. The concluding sections of Part II cover the planning of an aerial survey and the general requirements of specifications for aerial photography and mapping as applied to highway engineering. This latter material is a quotation from Bureau of Public Roads practice. Similarly, other sections of the book are enhanced by direct quotation from recognized authorities in certain phases of photogrammetry.

The Appendix includes tables of parallax and a tabulation of ground area dimensions corresponding to a 7- by 9-inch print of various focal lengths and flight altitudes. The author could have made the latter table more useful by including the 6-inch focal length which is characteristic of most wide-angle mapping photography in current use.

"Practical Photogrammetry" will doubtless give the practicing engineer an awareness of the utility of photogrammetry as a surveying tool and serve to guide him in selecting specialists to perform his work. Also, it should give the student engineer a taste of the subject, whetting his appetite for further knowledge which may be acquired by study of the references listed.

ROBERT E. ALTENHOFEN
U. S. Geological Survey

WORLD CARTOGRAPHY (Volume I, 1951). United Nations. *Columbia University Press* (International Documents Service) New York, N. Y. 1951. 107 pages. $1.25.

THE FIRST ISSUE of *World Cartography*, a United Nations cartographic bulletin, has just been published in accordance with the terms of resolution 261 (IX) of the Economic and Social Council. The publication, in the form of a report on the activities, progress, and plans for cartographic development throughout the world, will be issued annually.

The United Nations Economic and Social Council has as its objective up-to-date accurate surveying and mapping of all parts of the world, through the development of modern cartographic science and techniques and international cooperation in the field. Future issues of the bulletin will deal with all branches of cartography and cover the various phases of operation of world-wide cartographic undertakings. Among the phases of surveying and mapping to be covered are geodesy, topography, aerial survey and photogrammetry, gravity, geomagnetism, hydrographic surveying, geological surveying, resource surveying, special maps, and map reproduction. New processes, instruments and equipment, new developments in procedure and techniques, map projections, geographic names, international standards, technical specifications, and map scales are subjects to be considered in future issues.

The first bulletin is divided into four general sections: (I) General Questions; (II) Technical Notes and Studies; (III) Reports on Activities; and (IV) Bibliography. Sections I and II contain articles prepared by

scientists, section III comprises reports by national and international agencies, and section IV is a selected bibliography compiled by the cartographic office of the Department of Social Affairs in cooperation with interested scientific organizations.

ALBERT A. STANLEY
U. S. Coast and Geodetic Survey

AERIAL PHOTOGRAPHIC APPLICATIONS TO FORESTRY. C. William Garrard. (Bulletin 26 of the College of Forestry, Syracuse University, Syracuse, N. Y.) 1951. 81 pages.

THIS ANNOTATED BIBLIOGRAPHY was prepared by Mr. Garrard in partial fulfillment of requirements for the degree of Master of Forestry from the State University of New York, and is probably the first work of its kind to be published.

The listings are restricted to materials prepared or published since 1916 and relating specifically to the field of forestry. In addition to published works it includes titles of unpublished manuscripts wherever such information could be obtained.

It should be welcomed not only by libraries, but also by the entire surveying and mapping profession.

HELMUTH BAY
Rand McNally & Company

❦ ❦ ❦

International Congress and Exposition of Photogrammetry

The International Society of Photogrammetry will hold its Seventh International Congress and Exposition of Photogrammetry at the Shoreham Hotel, Washington, D. C., September 4–13, 1952, continuing at Wright-Patterson Air Force Base, Dayton, Ohio, September 15-16, 1952. Representatives of national societies of photogrammetry from all over the world are expected to attend.

The Washington meeting will be largely concerned with sessions of the Technical Commissions which include:

Commission I, Photography and Navigation
Commission II, Plotting Machines and Instruments
Commission III, Geodetic or Control Operations
Commission IV, Mapping From Photographs
Commission V, Special Applications and Measurements
Commission VI, Education, Terminology, Bibliography, History, Polyglot Dictionary
Commission VII, Photo Interpretation.

Arrangements have been completed to present simultaneous translations of all papers and reports in English, Spanish, French, and German.

The newest developments in photogrammetry, surveying, and mapping from many countries will be on public display throughout the meeting. Included in the program are tours of the Engineer Research and Development Laboratories, Fort Belvoir, Va., and the plant of the Army Map Service, Corps of Engineers. Three additional technical tours are being planned.

A complete ladies program has been arranged which includes a tea, a picnic and tour of Mount Vernon, a reception at the White House, a band concert, and a style show, as well as several events for both ladies and gentlemen including a cocktail party, a general sightseeing pleasure tour, a dinner, and a dance.

The shorter meeting at Dayton will include technical sessions on military photography and photogrammetry and on photo-reconnaissance and photo-interpretation, a tour of the Photographic Reconnaissance Laboratory of Wright Air Development Center, and inspection of photographic aircraft and equipment.

Inquiries concerning this meeting may be addressed to L. Ray Smart, Program Director, International Society of Photogrammetry, U. S. Geological Survey, Washington 25, D. C.

MAP INFORMATION

This department was inaugurated for the purpose of bringing to the attention of the members information pertaining to the availability of maps, surveys, etc., with particular emphasis on how such material can be procured. Authoritative articles covering this class of information are solicited. It is believed that through an interchange and dissemination of such information maximum benefits will accrue to the surveying and mapping profession.

—EDITOR

Topographic Maps

THE FOLLOWING quadrangle maps, topographic or planimetric, were published between December 1, 1951 and February 29, 1952, by the U. S. Geological Survey (New Publications Lists 521 through 523). Planimetric maps (no contours) are indicated in the list by the letter (P) following the name. All maps are available with or without the green overprint which indicates woodland. The quadrangle name is shown in capital letters, followed by the county name in upper- and lower-case letters. Since many quadrangle maps extend into several counties, only that county name is given which contains the place for which the quadrangle is named. For example, the quadrangle PLEASANT SITE, in *Alabama*, is in parts of Colbert and Franklin counties, but only Franklin is shown because the town of Pleasant Site is in that county.

Maps of areas east of the Mississippi River may be ordered from the Chief of Distribution, U. S. Geological Survey, Washington 25, D. C., and of areas west of the Mississippi River from the Distribution Section, U. S. Geological Survey, Denver Federal Center, Denver, Colorado.

Alabama

HALLTOWN—Franklin†
PLEASANT SITE—Franklin
VINA—Franklin

Alaska

ANCHORAGE (C-5)*—Third Judicial Division†
ANCHORAGE (D-2)*—Third Judicial Division†
BIG DELTA (A-5)*—Fourth Judicial Division†
BIG DELTA (B-5)*—Fourth Judicial Division†
BIG DELTA (B-6)*—Fourth Judicial Division†
BIG DELTA (C-6)*—Fourth Judicial Division†
BIG DELTA (D-6)*—Fourth Judicial Division†
FAIRBANKS (A-1)*—Fourth Judicial Division†
FAIRBANKS (A-2)*—Fourth Judicial Division†
FAIRBANKS (A-3)*—Fourth Judicial Division†
FAIRBANKS (A-5)*—Fourth Judicial Division†
FAIRBANKS (B-3)*—Fourth Judicial Division†
FAIRBANKS (B-5)*—Fourth Judicial Division†
FAIRBANKS (C-1)*—Fourth Judicial Division†
FAIRBANKS (C-2)*—Fourth Judicial Division†
FAIRBANKS (C-3)*—Fourth Judicial Division†
FAIRBANKS (D-3)*—Fourth Judicial Division†
GULKANA (A-3)*—Third Judicial Division†
GULKANA (A-4)*—Third Judicial Division†
GULKANA (A-6)*—Third Judicial Division†
GULKANA (B-3)*—Third Judicial Division†
GULKANA (C-2)*—Third Judicial Division
GULKANA (C-3)*—Third Judicial Division†
GULKANA (D-3)*—Third Judicial Division†
GULKANA (D-4)*—Third Judicial Division
HEALY (C-5)*—Fourth Judicial Division†
HEALY (D-1)*—Fourth Judicial Division†
MOUNT HAYES (A-3)*—Third Judicial Division
MOUNT HAYES (A-4)*—Fourth Judicial Division
MOUNT HAYES (B-4)*—Fourth Judicial Division†
MOUNT HAYES (C-4)*—Fourth Judicial Division†
MOUNT HAYES (D-4)*—Fourth Judicial Division†
MOUNT HAYES (D-5)*—Fourth Judicial Division†
MOUNT HAYES (D-6)*—Fourth Judicial Division†
NABESNA (D-5)*—Fourth Judicial Division
TALKEETNA MOUNTAINS (A-1)*—Third Judicial Division†
TALKEETNA MOUNTAINS (A-5)*—Third Judicial Division†
TALKEETNA MOUNTAINS (A-6)*—Third Judicial Division†
TALKEETNA MOUNTAINS (B-5)*—Third Judicial Division†
TALKEETNA MOUNTAINS (B-6)*—Third Judicial Division†

* Indicates 15-minute quadrangle; all others are 7½-minute quadrangles.
† Indicates map lies wholly within county named.
‡ Indicates availability in either a contour or a shaded-relief edition.

TALKEETNA MOUNTAINS (C-5)*—Third Judicial Division†
TALKEETNA MOUNTAINS (C-6)*—Third Judicial Division†
TALKEETNA MOUNTAINS (D-5)*—Third Judicial Division†
TALKEETNA MOUNTAINS (D-6)*—Third Judicial Division†
TANACROSS (A-3)*—Fourth Judicial Division†
TANACROSS (B-3)*—Fourth Judicial Division†
VALDEZ (D-6)*—Third Judicial Division†

Arkansas
RED BLUFF—Little River

California
DARWIN*—Inyo†
MALIBU BEACH—Los Angeles†
POINT DUME—Los Angeles
QUINCY—Plumas†
SPRING GARDEN—Plumas†

California-Arizona
NEEDLES*—San Bernardino

Colorado
HARDIN—Weld
NIWOT—Boulder†

Connecticut
UNCASVILLE—New London†

District of Columbia-Maryland-Virginia
WASHINGTON WEST—District of Columbia

Florida
FALSE CAPE—Brevard†
MIMS—Brevard†
PARDON ISLAND—Brevard
SADDLEBUNCH KEYS—Monroe†
TITUSVILLE—Brevard†
WILSON—Brevard

Georgia
COWROCK—White

Idaho
GLENNS FERRY*—Elmore
LEESBURG*—Lemhi†
SALMON*—Lemhi†

Indiana
GEORGETOWN—Floyd
LAGRO—Wabash
OTTERBEIN—Benton
WABASH—Wabash
WARREN—Huntington

Iowa
NEW VIRGINIA*—Warren

Kentucky
ELLISTON—Grant†
INDEPENDENCE—Kenton
LEXINGTON EAST—Fayette
LEXINGTON WEST—Fayette
VERONA—Boone
WILLIAMSTOWN—Grant

Kentucky-Tennessee
ALLENSVILLE—Todd
GUTHRIE—Todd

Maine
LUBEC—Washington

Maryland
BELTSVILLE—Prince Georges
KENSINGTON—Montgomery†

Maryland-District of Columbia
ANACOSTIA—District of Columbia
WASHINGTON EAST—District of Columbia

Maryland-Virginia
ROCKVILLE—Montgomery

Minnesota
MANKATO EAST*—Blue Earth

Minnesota-Wisconsin
PRESCOTT—Pierce

Mississippi-Alabama
BELMONT—Tishomingo
RED BAY—Franklin

Missouri
TINA—Carroll

Nebraska
BUTTE SE—Holt
BUTTE SW—Holt
DOUGHBOY*—Cherry†
GYPSY VALLEY*—Cherry†
MERRIMAN 4*—Cherry†
SPENCER SOUTH—Boyd

Nebraska-South Dakota
BUTTE NW—Boyd
ELI*—Cherry
MERRIMAN*—Cherry
NORDEN*—Keyapaha

Nevada-Arizona-California
DAVIS DAM*—Mohave

New Jersey
CHATSWORTH—Burlington
PEMBERTON—Burlington†
WOODMANSIE—Burlington

New York
ALBION—Orleans
ASHWOOD—Orleans†
BYRON—Genesee†
ITHACA EAST—Tompkins†
OAKFIELD—Genesee†

North Carolina
ARAPAHOE—Pamlico
UPPER BROAD CREEK—Pamlico

North Dakota
ARROWWOOD LAKE—Stutsman
BISMARCK*—Burleigh
BORDULAC NE—Foster†
COURTENAY NW—Stutsman
JAMESTOWN—Stutsman†
JIM LAKE—Stutsman†
PEKIN NW—Nelson†

Oregon
RITTER*—Grant

South Dakota
BOUQUET TABLE—Shannon
BURKMERE—Faulk
CLARK LAKE—Faulk
CONATA—Pennington
CONATA NE—Pennington
CONATA SE—Washabaugh
FAULKTON WEST—Faulk
NORBECK—Faulk
ONAKA—Faulk
ONAKA SW—Faulk

Tennessee
HEBRON—Hardeman
HORNSBY—Hardeman
MIDDLETON—Hardeman†
POCAHONTAS—Hardeman
SAULSBURY—Hardeman

Texas
CUTHBERT—Mitchell†

Utah
CEDAR MOUNTAIN—Iron†
ENOCH NW—Iron†
FORT DOUGLAS—Salt Lake
KANARRAVILLE—Iron†
LINCOLN POINT—Utah†

Virginia
ANNANDALE—Fairfax
BUENA VISTA—Rockbridge

Virginia-District of Columbia-Maryland
ALEXANDRIA—Fairfax

Virginia-Maryland
FALLS CHURCH—Fairfax

Washington
BENGE*—Adams
LA CROSSE*—Whitman
PRIEST RAPIDS*—Benton
TOGO MOUNTAIN—Ferry†

West Virginia-Virginia
RONCEVERTE*—Greenbrier

Wisconsin
PARRISH* (P)—Langlade
SPIRIT FALLS* (P)—Lincoln†

Wyoming
SIBLEY PEAK—Platte†

In addition to the standard series of quadrangle maps, reconnaissance maps at the scale of 1:250,000 are being published for both the continental United States and Alaska. Maps in this series published in the period include the following:

Alaska
KUSKOKWIM BAY—Fourth Judicial Division†
TRINITY ISLANDS—Third Judicial Division†

California
EUREKA

Maine and New Hampshire
PORTLAND

Maine, New Hampshire and Vermont
LEWISTON

New York
BINGHAMTON
GLENS FALLS
UTICA

New York and Vermont
LAKE CHAMPLAIN

Texas
BAY CITY

West Virginia, Ohio and Pennsylvania
CLARKSBURG‡

Comment and Discussion

The pages of SURVEYING AND MAPPING are open to a free and temperate discussion of all matters pertaining to the interests of the CONGRESS. It is the purpose of this Department to encourage comments on published material or the presentation of new ideas in an informal way. —EDITOR

TOPOGRAPHIC MAP SCALES

C. F. FUECHSEL*—The report presented by the Special Committee on Map Scales, published in the July–September 1951 issue of SURVEYING AND MAPPING, indicates that the subject matter was well investigated and soundly considered. At a recent technical society meeting one of the speakers mentioned the report, noting that the committee had deplored the multiplicity of topographic map scales, and had recommended that "nothing be done about it." The remark was made facetiously, of course, as the committee had spelled out the practical considerations that make it inadvisable to attempt to change the *status quo* at this time. A discussion of some of these considerations and their backgrounds may be of interest to those concerned with topographic maps.

As the early reports of the Geological Survey and its predecessor agencies indicate, the selection of publication scales for topographic maps was by no means a casual undertaking. Careful consideration was given to various aspects of map-use requirements, the expanding development of the country, and the experiences of other nations. The limitations inherent in topographic map programming from the beginning—big agendas and small w h e r e w i t h a l s—made it necessary to stretch survey dollars as far as possible. This was particularly true in the early years when, fortunately, map detail and accuracy requirements were not so critical. Thus, reconnaissance mapping standards and compatible publication scales were the inevitable choices of that day. In this connection, the following excerpt from an early statement on scales and other facets of topographic mapping[1] is of considerable interest:

"The scales which have finally been adopted for publication of the maps are 1:62,500 and 1:125,000. When this work was commenced in 1882, three different scales were used for different parts of the country, depending upon the degree of complexity of the topography and the geological phenomena, upon the density of population and industrial importance of the region. These scales were 1:62,500, 1:125,000, and 1:250,000. The maps have found extended use, not only among geologists, but in all sorts of industrial enterprises with which the surface of the ground is concerned, and have already become well nigh indispensable in the projection of railroads, water and drainage works, systems of irrigation, and similar industrial enterprises. Their extended use has developed a requirement for maps of larger scale with greater detail. This requirement has been met by discontinuing mapping at the scale of 1:250,000, and since that time the requirement standards have continued to rise. Consequently, plans have been made to extend the areas to be mapped upon the scale of 1:62,500 with a corresponding reduction of the areas planned for mapping at 1:125,000. These scales are considered sufficiently large to present the details of nearly all geological phenomena. The map represents the country in sufficient detail to admit of the selection upon it of general

* Chief, Cartography and Map Editing, Topographic Division, U. S. Geological Survey.

[1] GANNETT, HENRY: *A Manual of Topographic Methods.* U. S. Geological Survey, Washington. 1893.

routes for railroads and other public works and to show the meanders of boundary lines. On the other hand, the scales are not so large as to prevent the representation upon a single sheet of a considerable area, so that the relations between different regions can be seen at a glance.

"The experience of the European nations which have prepared topographic maps of all or parts of their areas (while certain of them have mapped their entire areas several times) is of great service and points unmistakably in the direction of the adopted scales. The history of these nations in this matter presents a singular degree of uniformity. Their first maps were upon large scales, and upon them they attempted to represent all details of natural and artificial topography (even property lines) so that one set of maps would answer for all purposes. Experience of the difficulty and expense of keeping up such maps indicates that economy consists in the production of a series of maps each designed to serve a special purpose; one as a cadastral map, another as a military map, and another as a general topographic map. It further taught that this topographic map should be on a comparatively small scale, and accordingly, the maps of foreign countries are usually published on scales approximating one mile to an inch, which is sufficient to show topographic details of a general character, and serves all ordinary purposes."

In the light of subsequent developments the policy makers of 1893 were not far amiss, and were not unaware of the fact that the expanding economy would eventually require a larger map scale for critical areas. The natural choice was again to double the scale, this time with the actual half-mile-per-inch ratio (1/31,680). Engineering preference for a larger map sheet, and direct foot ratios, finally led to the adoption of 1/24,000 (2000 feet per inch) scale as standard for the 7½-minute map series in most areas. The 1/31,680-scale maps are therefore being converted to 1/24,000 at reprint stage as circumstances may permit.

Thus the present scale standards (1/24,000 for the 7½-minute series and 1/62,500 for the 15-minute series) have changed from those of 60 years ago only to the extent of advancing scale objectives one step. The present plan for the country at large is to afford complete map coverage with a 15-minute atlas series at 1/62,500 scale (rather than 1/125,000 as originally planned) while the critical areas are also to be covered with a 7½-minute series at 1/24,000 scale (rather than 1/62,500 as originally planned)—not bad guessing for 60 years ago.

The Surveyor's Notebook

W. & L. E. Gurley, manufacturer of engineering instruments, announces the publication of "The Surveyor's Notebook," a collection of short articles on unusual field surveying problems and how they were solved by the ingenuity of the surveyor or engineer.

The first page in "The Surveyor's Notebook" tells how one surveyor helped lay an oil pipeline in record time by using a few "tricks of the trade." In another article, a county surveyor from Nebraska gives his method for quickly determining a quarter section line when it is completely blocked by railroad cars.

One story explains how a Commonwealth of Massachusetts survey party used captive pilot balloons to get initial lines between stakes separated by heavy timber, while others outline ways to improve land survey records and the advantages of a solar transit.

Among the surveying tips are a remedy for "frozen" tripods and a method for leveling over 10 feet of corn. Unusual stories in the collection include the problems of surveying in the Arctic; unique transit practices of the Corps of Engineers in obtaining the first accurate survey of the Niagara River bed; use of transits and levels inside an aircraft plant; and how transits measured movement of a bell tower.

Free copies of "The Surveyor's Notebook" may be obtained by writing W. & L. E. Gurley, Troy, N. Y.

CONGRESS NEWS

Texas Section

O. E. Young, Assistant Chief Engineer of the Humble Oil & Refining Company, was elected 1952 chairman of the Texas Section of the American Congress on Surveying and Mapping at its fourth meeting on February 21, 1952, at Hugh Wilkin's Armadillo Club, Houston. Grant W. (Buck) Herzog, the retiring chairman, commented on the aims and activities of the Texas Section and gave a brief summary of the work accomplished by the surveying organization during 1951. Other officers elected for a 1-year term are as follows:

R. A. Washburn, *First Vice-Chairman*
Robert M. Atkinson, *Second Vice-Chairman*
W. H. Wilson, *Third Vice-Chairman*
Forrest Daniell, *Secretary*
George M. Livingston, *Treasurer*

Directors were elected for a 2-year term, as follows:

J. A. Tomlinson
L. E. Cornitius
R. K. Daley

R. L. Engdahl, Chief of Party of the U. S. Coast and Geodetic Survey, spoke on the early history of his organization. Mr. Engdahl also outlined the scope and nature of the triangulation now being performed by his crew of 38 men in Harris and Montgomery Counties. After his talk, Mr. Engdahl displayed the various instruments used by his party.

The Texas Section of the ACSM has a roster of about 90 members, and has meetings at least four times a year.

FORREST DANIELL
Secretary

Annual Meeting, Quebec Land Surveyors

THE CORPORATION OF QUEBEC LAND SURVEYORS met for its 69th Annual Meeting in the City of Quebec on April 15 and 16, 1952. The American Congress on Surveying and Mapping was represented by its past president, Sol A. Bauer. Two papers were presented: one by Prof. Z. Rousseau of Laval University, on the new curriculum of the college of surveying and forestry at the University; the other was by Prof. M. L. Joncas, on the subject of surveying accuracies. A formal banquet, presided over by President Henri Bélanger on the evening of April 15th, was the social highlight of the meeting. Marc Boyer of the Department of Mines and Technical Surveys gave the principal address, in which he urged surveyors to extend themselves beyond their immediate field into the realms of social and political ideas, and to lend full support to the United States Program for World Peace and the support of less fortunate countries.

Wednesday was occupied with business meetings and reports from the various officers and committees. The Congress representative was introduced in most flattering terms, and the close relationship of the Quebec Corporation of Land Surveyors with ACSM was stressed by D. I. O'Gallagher. The meeting was attended also by Bruce Waugh, Surveyor General of Canada; William Miller, of the Department of Mines & Technical Surveys of Ontario; F. W. Beatty, of the Department of Lands & Forests; and A. J. Nash, president of the Ontario Land Surveyors Association.

Election of officers was held during the afternoon, at which time D. I. O'Gallagher was elected president for the coming term. Mr. O'Gallagher revived what he claimed to be one of the oldest traditions of the organization, that is, the privilege of the incoming president to kiss the ladies, who were present at a tea which the members of the Corporation attended after the final business session.

With a combination of Celtic and Gallic grace, Mr. O'Gallagher honored the ACSM by making the wife of the Congress representative the first recipient of his traditional privilege.

The meetings of the Quebec Corporation are distinguished by their dignity and gracious hospitality. The reputation of the Congress is at a high point among our Canadian neighbors, and it is a delightful experience to have the privilege of attending any of their gatherings. The Congress was further honored by the appointment of the incoming president, Mr. O'Gallagher, as representative of the Quebec Corporation at the coming Annual Meeting of the Congress in Washington.

—S. A. BAUER

❦ ❦ ❦

Obituaries

Mr. Ned H. Sayford, who was made an honorary member of ACSM at the Eleventh Annual Meeting last year, died on February 5, 1952.

Mr. Sayford was a well-known civil engineer, only recently retired from active service in the Tennessee Valley Authority, where he headed the Maps and Surveys Branch for more than 18 years. Prior to his TVA service, he was for many years vice-president of Morgan Engineering Company at Memphis, Tennessee. Mr. Sayford's biography was more fully reported on page 308 of the July-September 1951 issue of SURVEYING AND MAPPING.

Mr. Sayford's many contributions to the development of modern mapping procedures and his contribution to mapping effort in World War II will long be remembered as outstanding achievements.

Dr. Henry Wild, 74, brilliant inventor and designer of surveying, astronomical, and photogrammetric instruments, died on December 26, 1951, in Baden, Switzerland.

For the past 30 years the name Wild played a decisive part in the development of modern surveying instruments. The Wild-designed surveying instruments are well known all over the world.

Dr. Henry Wild was a graduate of the Engineering College of Winterthur near Zurich, Switzerland. In 1905 he developed his first modern theodolite and in 1908 he became the head of the newly created surveying instrument division of the well-known Carl Zeiss Company of Jena, Germany. Dr. Wild introduced in the Zeiss surveying instruments such features as the split coincidence bubble, the cylindrical vertical axis, and interior focusing.

In 1919 Dr. Wild returned to Switzerland and founded the Henry Wild Company of Heerbrugg, Switzerland; he was the designer and developer of several new leveling instruments, theodolites, and photogrammetric plotters. In 1930 the Swiss Federal Institute of Technology in Zurich bestowed upon him the honorary degree of Doctor in Engineering Sciences.

In 1932 he retired from the Wild Company and in 1935 he associated himself with the Kern Company of Aurau, Switzerland and developed new improved theodolites, such as the DKM-1, the DKM-2, and the DKM-3, including new types of tripods. In the DKM-3, a first-order triangulation theodolite, Dr. Wild introduced a new reflecting telescope which greatly improved the optical performance of the measuring telescope.

Henry Wild, Jr., vice-president of the Kern Company.

His work is being carried on by his son

❦ ❦ ❦

FROM A NEW MEMBER

"Thanks very much for your note and your acceptance of me as a member. I only wish I had known of your organization sooner. I have been more or less waging a one-man fight for years for more recognition for the surveyor and his work. I have always felt it to be a very important, interesting, and difficult field requiring much more recognition and training that it ever receives; so keep up the good work."

NEW MEMBERS

The Membership Roster published elsewhere in this issue includes new members only to December 31, 1951. This list of *new* members is supplemental and includes new members from January 1 to March 19.

INDIVIDUAL MEMBERSHIPS

ADAMS, Ray, Houston Lighting & Power Co., Engineering Dept., 1016 Walker St., Houston, Tex.—Chief of Survey Party

ALEXANDER, William N., 3800 Porter St., N.W., Washington, D. C.—Civil Engineer, Rivers & Harbors, U.S.E.D.

ANKER, Knute, 737 Dayton Ave., St. Paul, Minn.—Surveyor, Ramsey County Surveyor's Office

ARENDT, Prof. John, Jr., 1250 Big Falls Ave., Akron 10, Ohio—Asst. Professor, Fenn College

ASHMEAD, R. B., 112½ N. Eighth St., Lebanon, Pa.—Registered Surveyor

BAIRD, Philip J., 16 Niles Rd., Newton Highlands 61, Mass.—Civil Engineer and Land Surveyor, Henry F. Bryant & Son, Inc.

BAKER, George L., 5656 Buffalo Ave., Van Nuys, Calif.—Sr. Surveyor, Shell Oil Co.

BAKER, Robert H., 465 N. Normandie St., Hollywood, Calif.—Office Manager, Pafford, Jones & White, Surveyors

BALL, M. P., Phillips Apartment Hotel, Bartlesville, Okla.—Supervisor of Surveying, Phillips Petroleum Co.

BARE, Ben K., 584 E. Broad St., Columbus, Ohio—Partner, Burgess & Niple, Consulting Engineers

BATES, C. Woodrow, P.O. Box 592, Berkeley, Calif.—Civil Engineer

BESSMER, Dwight A., Asst. to President, The Timken Roller Bearing Co., 1839 Dueber Ave., Canton 6, Ohio

BIANCO, Albert A., 418 Beach 43rd St., Edgemere, N. Y.—Manager, Vandewater & Lapp

BLAIR, Edward F., 814 Lake Breeze Rd., R.D. #1, Lorain, Ohio—Surveyor and Engineer

BLEWETT, J. A., Rm. 932, 714 W. Olympic Blvd., Los Angeles, Calif.—Geological Draftsman, Sunray Oil Corp.

BLOOMGREN, George S., 102½ E. 5th St., East Liverpool, Ohio—Civil Engineer and Surveyor

BLYDENBURGH, John B., Wells & Blydenburgh, Northport, N. Y.

BOEDDEKER, Wm. A., Cincinnati Union Terminal Co., 1301 Freeman Ave., Cincinnati 3, Ohio—Engineer and Draftsman

BOLTER, Ward H., Keuffel & Esser Co., 300 Adams St., Hoboken, N. J.—Manager, Branch House Dept.

BONUS, Edward A., R.F.D. #1, New Brunswick, N. J.—Chief of Party

BORN, D. Russell, 251 S. Broadway, New Philadelphia, Ohio—Engineer, Born & Born, Engineers and Surveyors

BORTON, Maynard, County Engineers Office, Court House, Wilmington, Ohio—Chief Deputy, Clinton County

BOSLEY, William H., Safe Harbor Water Power Corp., R.D. #2, Conestoga, Pa.—Surveyor and Chief of Field Parties

BOYSEN, Alfred H., 6112 Tipton Way, Los Angeles 42, Calif.—Supervisor of Surveys, City of Los Angeles

BOZ, Joseph D., 551 Main St., Coshocton, Ohio—Civil Engineer and Surveyor

BRABSON, William H., Sr., 30 Park Ave., Oakwood, Dayton 9, Ohio—Asst. City Manager and City Engineer, Oakwood, Ohio

BRITT, Willard S., 1228 N. Taylor St., Arlington, Va.—Cartographic Compilation Aid, USGS

BROWN, A. R., 733 N. Edgemont St., Hollywood 27, Calif.—Surveyor and Computer, Holmes & Narver, Inc.

BROWN, Chandler W., College of Engineering, Duke University, Durham, N. C.—Instructor in Civil Engineering

BURGER, Thomas C., 310 W. 16th St., Rolla, Mo.—Surveying & Cartographic Engineer, USGS

BURKHEAD, C. G., The Superior Oil Co., 930 Edison Bldg., Los Angeles, Calif.—Chief Draftsman

BYRNES, Claire J., c/o Geophysical Dept., Continental Oil Co., Ponca City, Okla.—Chief Surveyor

CHAMBERLAIN, Ellis D., USGS, 1109 N. Highland St., Arlington, Va.—Topographic Engineer

CHASE, Frank R., 3062 Carlsen St., Oakland, Calif.—Engineer, Alameda County, East Bay Title Insurance Co.

CHOCK, San Lun, 1734 A. Paula Drive, Honolulu, T. H.

CLARK, James, USGS, P.O. Box 346, Sacramento 2, Calif.—Topographic Engineer

COCKING, Albert, 415 S. 5th St., Burbank, Calif.—Instrumentman, Maps & Surveys, City of Los Angeles

COON, R. S., 1428 Benton St., Alameda, Calif.—Cartographic Draftsman, Corps of Engineers

COOPER, Franklin D., 321 Landsdowne Rd., DeWitt, N. Y.—Owner, Franklin D. Cooper Aerial Surveys

CORREA, Marcellino P., 725 12th Ave., Honolulu, T. H.

CORTS, Howard T., 344 S. Bellevue Ave., Langhorne, Pa.—Engineer of Construction, United States Steel Co.

COULTER, C. E., 3439 Garfield Ave., S. Minneapolis 8, Minn.—Land Surveyor

CURTIS, Clement B., 337 Valleyscent Ave., Scotch Plains, N. J.—Survey Party Chief, Edward S. Lewis, P.E. and L.S.

DAVISON, F. L., Farmdale, Ohio—Surveyor and Civil Engineer

DE GARMO, George J., Aerial Surveys, 34B E. Main St., Freehold, N. J.—Engineer and Surveyor

DELALLA, O. Thomas, 101 Washington St., Morristown, N. J.—Partner, Jenkins & DeLalla, Engineers and Surveyors

DELORME, Murrett H., 7 Crescent Beach Rd., Glen Cove, N. Y.—Civil Engineer and Surveyor

DELOYE, Robert B., 42 North St., Pittsfield, Mass.—Engineer and Contractor, Robert B. Deloye, Inc.

DEMPSEY, John M., P.O. Box 1429, Jackson, Miss. Asst. Supervising Engineer, Michael Baker, Jr., Inc.

DILLON, Francis B., Jr., 5616 Thirteenth St., N.W., Apt. 301, Washington 11, D. C.

DILLON, Tom, 6215 Beckman St., Houston 21, Tex.—Civil Engineer, Union Sulphur & Oil Corp.

DONATH, Walter, 2324 Denniston Ave., Roanoke, Va.—Construction Engineer

DOUGHERTY, George B., 6333 Regent St., Philadelphia 42, Pa.—Surveyor

DOWNS, William M., National Geophysical Co., Inc., 8800 Lemmon Ave., Dallas 9, Tex.—Party Chief

EIDT, John N., 12055 Edgewater Dr., Lakewood 7, Ohio—Asst. Engineer, New York Central R.R.

ENGDAHL, Robert L., Sr. Geodetic Engineer, USC&GS, Washington 25, D. C.

ENGLEMAN, H. K., Phillips Petroleum Co., Bartlesville, Okla.—Sr. Surveyor and Mapsman

ERKEL, Howard R., 2080½ Summit St., Altadena, Calif.—Draftsman, Richfield Oil Corp.

EVERTZ, Robert C., P.O. Box 122, Hackettstown, N. J.—Land Surveyor

FAHEY, Lawrence, Aero. Chart & Information Service, 11th and F Streets, N.W., Washington, D. C. —Research Analyst

FEILD, Russell W., c/o Stanolind Oil & Gas Co., Atmore, Ala.—Surveyor

FERRIS, John P., Engineer, N. Y. C. R. R. Co., 230 E. 9th St., Cincinnati, Ohio

FITTS, E. P., Macon, N. C.—Land Surveyor

FLACK, William R., 372 Broad St., Wadsworth, Ohio—Civil Engineer and Surveyor

FLICK, Justin T., 65 Brooklyn Ave., Valley Stream, N. Y.

FORKERT, Clifford A., 2413 Lincoln Ave., Montebello, Calif.—Civil Engineer

FOSTER, Charles Edwin, 194 Fall St., Seneca Falls, N. Y.—Asst. Civil Engineer, N. Y. State Dept. of Public Works

FRANK, Joseph A., General Petroleum Corp., 612 S. Flower St., Los Angeles, Calif.—Asst. Chief Draftsman

FRAZIER, Mrs. Mary T., 4087 8th Ave., Los Angeles, Calif.—Geological Draftsman, Capital Co.

FROLICHER, Harold E., Nunlist & Frolicher, 1012 Traction Bldg., Cincinnati 2, Ohio—Engineer, Surveyor, and Senior Partner

GALLO, Prof. Frank J., Asst. Prof. of Civil Engineering, Fenn College. Cleveland 15, Ohio

GEORGE, Robert E., 2329 Berwick Blvd., Columbus 9, Ohio—Surveyor, The Ohio Fuel Gas Co.

GIFFORD, C. Keeler, President, C. Keeler Gifford Engineering Co., Inc., 13 S. Broad St., Ridgway, Pa.—Civil Engineer and Elk County Surveyor

GIGAS, Erwin F., Director, Institut fur Angewandte Geodasie, 325 Friedberger Landstr., Frankfurt, Germany

GILMAN, Clarence R., USGS, 1109 N. Highland St., Arlington, Va.—Topographic Engineer

GLASER, Raymond, 3711 Gwynn Oak Ave., Baltimore 7, Md.—Cartographer, USC&GS

GLASGOW, 1st Lt. Donald J., C.E., 66th Engr. Topo. Co., APO 107, New York, N. Y.—Surveying Engineer, U. S. Army

GLAZIER, Russell T., Gordon Russell Neal & Associates, 203 E. 7th St., Cincinnati 2, Ohio—Field Engineer

GOIN, Stephen, Jr., 85 Duval Dr., South San Francisco, Calif.—Draftsman "A"

GOODE, Richard U., 203 S. Braddock St., Winchester, Va.—Land Surveyor

GRAVES, Maj. Donald J., USAF, 3811 E. 4th St., Dayton, Ohio—Photogrammetric Engineer, Asst. Chief, Mapping & Charting Branch, Wright Air Development Center

GRAVETT, S. Woody, 7700 Hinds Ave., North Hollywood, Calif.—Partner, Juras & Gravett, Licensed Land Surveyors

GREEN, Robert D., Thompson, Ohio—Surveyor

GROSVENOR, I. R., P.O. Box 201, Paoli, Ind.—Orange County Surveyor

GURAN, J. D., 649 Brown St., Akron, Ohio—Engineer and Surveyor, Guran Construction Co.

HAAG, Erle L., 429 Knarr St., DuBois, Pa.—Asst. Mining Engineer, Northwestern Mining & Exchange Co.

HAINES, D. H., 16425 Maple Wild Ave., Seattle 66, Wash.—D. H. Haines & Associates, Civil Engineers and Land Surveyors

HAINES, Donald H., Richfield Oil Co., 555 S. Flower St., Los Angeles, Calif.—Acting Chief Cartographer, Land Dept.

HANSEN, John H., 3536 Kershaw St., Toledo 13, Ohio—Asst. Chief Structural Engineer, L.O.F. Glass Co.

HAUSERMAN, William R., 552 Park Ave. W., Mansfield, Ohio—Partner, Kenneth P. Shaffer Construction Engineer

HAWN, Norman L., 5115 E. 113th St., Garfield Heights 25, Ohio—Field Engineer, Republic Steel Corp.

HEALEY, Giles Greville, 1423 Chautauqua St., Pacific Palisades, Calif.—Explorer

HELLER, William M., 537 Ivy St., Pittsburgh 32, Pa.—Staff Engineer, West Penn Power Co.

HENDERSON, Thomas J., c/o Hanna Coal Co., St. Clairsville, Ohio—Civil Engineer

HENNING, B. F., Wood County Engineer, Court House, Bowling Green, Ohio

HENRY, Walter H., City Bldg., East Liverpool, Ohio—Surveyor

HICKLE, Joseph, Hanna Coal Co., Georgetown No. 12 Mine, Adena, Ohio—Engineer

HIGGINS, Prof. Francis V., 2769 Lancashire Rd., Apt. 3, Cleveland 6, Ohio—Asst. Prof. of Engineering Mechanics, Fenn College

HILDEBRAND, Wm. Lloyd, 358 W. Lutge Ave., Burbank, Calif.—Geological Draftsman, The Superior Oil Co.

HILL, William S., 1915 Lawrence Ave., Toledo 6, Ohio—Civil Engineer and Paving Engineer, City of Toledo

HIRST, Frank T., 1054 Woodville St., Toledo 5, Ohio—Civil Engineer, Ohio State Dept. of Highways

HOOVER, Howard H., Division of Highways, 1657 Riverside Dr., Redding, Calif.—Associate Highway Engineer

HORNER, F. H., 170 Dodge Ave., Akron, Ohio—Surveyor

HYDE, Gerald R., 61 Franklin St., Nashua, N. H.—Consulting Forester

JANETTE, Pierre R., Rm. 400, Seaboard Oil Co., 612 S. Flower St., Los Angeles 17, Calif.—Draftsman

JENKINS, Robert E., 110 First Ave., Gallipolis, Ohio—President, Jenkins Conc. Prod. Co.

JOHNSON, George W., Jr., 235 Madison St., Boonton, N. J.—Chief of Party

JOHNSON, William P., Winston, Ga.—Land Surveyor

JONES, Don P., 5317 Hollywood Blvd., Hollywood 27, Calif.—Partner, Pafford, Jones & White, Surveyors

JONES, Harry P., 420 Larch Lane, Sacramento, Calif.—Cartographer, USGS

JONES, Ray W., Route #2, Snow Hill, N. C.—Land Surveyor

JONES, Thomas J., 1206 Maryland Ave., Steubenville, Ohio—Supt. Gen. Yard & Switching, Wheeling Steel Corp.

JONES, Walter T., P.O. Box 538, Hickory, N. C.—Civil Engineer, Jones & Miller Engineering Co.

JORDAN, Luis, Jr., The Powhatan Mining Co., 802 First National Bank, Bellaire, Ohio—Asst. Chief Engineer

KADOW, Robert J., 2236 Beverly Blvd., Los Angeles 4, Calif.—Partner, S. B. Barnes, Construction Structural Engineer

KEELING, Leighton, Surveyors Service Co., 2021 S. Grand St., Los Angeles 7, Calif.—Secretary

KIMMEL, Harry W., R.D. #2, Friedens, Pa.—Surveyor

KING, Hiram J., 1499 Ridgewood St., Lakewood, Ohio—Surveyor

KING, Randolph S., P.O. Box 77, Sinton, Tex.—Civil Engineer, Plymouth Oil Co.

KOSER, Fred H., Landisville, Pa.—Surveyor

KRICHBAUM, Earl F., Sr., 75 W. Florida Ave., Youngstown 7, Ohio—Engineering Dept., Youngstown Sheet and Tube Co.

KUGEL, F. O., 335 Brevoort Rd., Columbus 14, Ohio—Chief, Div. of Shore Erosion, Ohio Dept. of Natural Resources

LALANNE, F. Joseph, 9357 S. Maryknoll Ave., E. Whittier, Calif.—Sr. Geological Draftsman, Continental Oil Co.

LANE, Elmer W., Surveyor's Office, 2608 Alturas Dr., Bakersfield, Calif.—Surveyor

LAROSEE Paul H., 349 Homestead Ave., New Orleans 20, La.—Civil Engineer, David W. Godat & Associates, Consulting Engineers

LAWRENCE, R. Lynn, Vice President, Jennings Lawrence Co., 12 N. 3rd St., Columbus, Ohio—Registered Surveyor

LEADERS, John E., 208 Fifth St., Defiance, Ohio—Engineer, The Leaders Asphalt Paving Co.

LENHART, E. C., Worthington & Lenhart, 530 S. Center St., Casper, Wyo.—Surveyor and Engineer

LEVAN, Donald R., 1909 Chestnut St., Harrisburg, Pa.—Engineering Asst., Howard A. LeVan, Jr.

LEWIS, Howard R., Sr., 2154 Norwood Blvd., Zanesville, Ohio—Chief Engineer, The Muskingum Coal Co.

LINDBERG, Leonard E., 1908 A Street, Eureka, Calif.—Logging Engineer, Mutual Plywood Corp.

LIPSCOMB, John C., Stanolind Oil & Gas Co., P.O. Box 3092, Houston, Tex.—Division Title Surveying Supervisor

LOFTUS, Thos. S., 519 Ross St., Steubenville, Ohio—Party Chief, Wheeling Steel Corp.

LOOK, R., 523 East B St., Iron Mountain, Mich.—Resident Engineer, Wisconsin Michigan Power Co.

LORAH, C. L., 404 Hamlin St., Smethport, Pa.—Engineer and McKean County Surveyor

LOWENHAUPT, Malcolm D., 67 Tillotson Rd., Fanwood, N. J.—Transitman, Harry L. Paff, P.E. and L.S.

LYNN, Kenneth A., 216 High St., N.E., Warren, Ohio—Surveyor and Engineer, Bricker & Lynn

MacFADYEN, Kenneth A., 51 Pill Hill Rd., Bernardsville, N. J.—Engineer and Land Surveyor

MAHONE, Leslie W., 304 Third Ave., N., Clear Lake, Iowa—Civil Engineer and Land Surveyor

MALM, Lester, 52 Montauk Ave., Merrick, N. Y.—Land Surveyor and Partner, Reilly & Malm

MARSHALL, Charles C., C.E., 120 Portage Trail, W. Cuyahoga Falls, Ohio—Field Engineer and Asst. City Engineer

MARSHALL, Ralph B., USGS, 1109 N. Highland St., Arlington, Va.—Surveying and Cartographic Engineer

MASON, George H., 202 Conover Ave., Eureka, Ill.—Surveyor, Austin Engineering Co.

MASTEN, Floyd E., U. S. HICOG, Headquarters Bldg., Box 200, APO 80, c/o Postmaster, New York, N. Y.—Diplomat, U. S. Dept. of State

MAXHEIMER, Howard M., 620 W. Walnut St., Ashland, Ohio—City Engineer, Ashland, Ohio

MAYER, George P., R. R. #1, New Carlisle, Ohio—Chief, Record Drawing Unit, Wright-Patterson Air Force Base

MAYERS, Chas. W., 3856 Revere Dr., Toledo 12, Ohio—Chief Surveyor, Lucas County Engineers Office

MAYS, Maj. Raymond R., HQ Caribbean Command, Quarry Heights, Canal Zone—Mapplan Officer

McCALLUM, William M., 1011 W. 6th St., Little Rock, Ark.—U. S. Engineers

McCLURE, Harold R., 45 S. Halloway St., Dayton, Ohio—Civil Engineer and Surveyor, Harold R. McClure Engineering Co.

McDANIEL, Earl K., 749 Columbia Rd., Berkley, Mich.—Surveyor, Sam Walker & Associates

McDAVID, John J., Jr., Farmville, N. C.—Registered Surveyor

McELHANY, Stephen S., 17721 Lakewood Heights Blvd., Lakewood, Ohio—Asst. Supt. of Gas Measurement, The East Ohio Gas Co.

McGRATH, C. L., 47 Bradford St., Pittsburgh, Pa.—Superintendent, Blaw-Knox Construction Co.

McMANIS, James O., 501 E. Walnut St., West Union, Ohio—Registered Surveyor

MEIKLEJOHN, Arthur W., 747 61st St., Oakland, Calif.—Title Engineer, Oakland Title Ins. & Guar. Co.

MEYRING, M. B., Box 41, Edmonds, Wash.—Engineer, M. B. Meyring Co.

MIDDLETON, LeRoy F., Box 1061, Edmonds, Wash.—Asst. Engineer, M. B. Meyring Co.

MOLLENHAUER, Robert L., 17 E. Linda Vista St., Alhambra, Calif.—Party Chief, R. B. Huey Co.

MONNINGH, C. M., Route #2, Ionia, Mich.—Registered Land Surveyor

MONTGOMERY, Stanley E. 427 N. Charity St., Bethel, Ohio—Surveyor and Chief of Party

MOSBACHER, Vincent L., Rapid Blue Print Co., 818 Santee St., Los Angeles, Calif.—Sales Manager

MUIR, Alexander, Jr., 789 Muir Terrace, Scotch Plains, N. J.—Land Surveyor, Harry L. Paff, P.E. and L.S.

MURPHY, Robert A., 93 Clark St., Clinton, Mass.—Land Surveyor

MYERS, Byron R., East Ohio Gas Company, 19 N. High St., Akron 8, Ohio—Engineer

NEAL, Gordon R., 203 E. 7th St., Cincinnati, Ohio—Head of Gordon Russell Neal & Associates, Engineering Firm.

OAK, Jesse C., USGS, 1109 N. Highland St., Arlington, Va.—Cartographic Compilation Aid

OKRUSKO, Andrew, Union Oil Co. of Calif., Room 1115, 617 W. 7th St., Los Angeles 17, Calif.—Draftsman

OLSON, Willard E., Dietrich-Post Co., 1205 S. Olive St., Los Angeles, Calif.—Salesman (Engineering)

PALMROSE, Dudley M., 3429 E. Colorado St., P.O. Box 91E, Pasadena 8, Calif.—Surveying Student at Pasadena City College

PATON, Commander Hubert A., USC&GS, 518 E. 32nd St., Baltimore 18, Md.

PATRIDGE, Robert T., 131 N. Brinker Ave., Columbus, Ohio—Surveyor and Map Draftsman, Ohio Ohio Fuel Gas Co.

PEARSON, Rice R., 601 City National Bank Bldg., Houston, Tex.—Junior Engineer, Phillips Petroleum Co.

PERGI, Frank A., C.E., 601 Logan Ave., Mingo Junction, Ohio—Project Engineer

PHILLIPS, John O., Pan American Production Co., 1210 Esperson Bldg., Houston, Tex.—Manager of Civil Engineering

PHILIPPS, Samuel D., R.F.D. #2, Granville, Ohio—Research Engineer, Owens-Corning Fiberglas Corp.

PORTER, Robert B., USGS, 227 Oxford St., Martin, Tenn.—Surveying and Cartographic Engineer

PRIME, Theodore S., 375 N. Y. Ave., Huntington, N. Y.—Surveyor, A. J. Edwards—T. S. Prime

PUTNAM, R. N., Division of Highways, 1657 Riverside Dr., Redding, Calif.—Surveys and Plans Engineer

RADCLIFFE, David L., 223 Earnshaw Drive, Dayton 9, Ohio—Photogrammetric Engineer, Wright Air Development Center

RAUPP, Wm. H., 5270 37th Ave., Sacramento, Calif. Surveyor and Asst. Civil Engineer, Dept. of Natural Resources, State of Calif.

RENEY, John J., 29 Trowbridge Rd., Worcester 2, Mass.—Engineer and Surveyor

ROE, Alfred W., 1 Roe Court, Patchogue, N. Y.—Justus Roe & Sons, Steel Tape Manufacturers

ROOSE, James F., 1118 E. Third St., Ottawa, Ohio—Civil Engineer and Surveyor

ROSING, Anton S., 461 Allwen Dr., Dayton 6, Ohio—Chief, Geodetic Control Unit, Photo Reconnaissance Lab., Wright Air Development Center

RUCKER, B. T., 2421 25th St., Lubbock, Tex.—Surveying and Mapping Contractor

RYDEEN, James P., 607 W. 7th St., Rolla, Mo.—Civil Engineer, USGS

SALAK, John P., Weaver & Salak, 220 E. Market St., Warren, Ohio—Civil Engineer and Surveyor

SALO, Jack D., 15 E. 1st St., Duluth, Minn.—Civil Engineer and Land Surveyor

SALOTTI, Emil E., 1327 Sixteenth St., N.W., Washington 6, D. C.—Cartographic Compilation Aid, USGS

SCHUMAKER, I. Ripple, Bazley & Schumaker Engineering Co., P.O. Box 141, Colorado Springs, Colo.—Professional Engineer

SIERGIEJ, Joseph, 6901 Grandville St., Detroit 28, Mich.—Chief of Party, Surveying and Inspection Div., Detroit Edison Co.

SKORDAL, Henry B., USGS, Box 133, Rolla, Mo.—Cartographic and Survey Aid

SLECHTA, James L., 2124 Bolton St., Baltimore 17, Md.—Cartographic Aid, Army Map Service

SMITH, Howard P., Pfc, 3200th Photographic Test Sqdrn., Elgin Air Force Base, Fla.—Cartographic Specialist

SMITH, Robert T., P.O. Box 316, Hickory, N. C.—Surveyor, Miller & Smith Surveying & Maping Co.

SOLAS, Jose, Land Transfer Board of Guam, Box 532, Guam, M. I.—Civil Engineer and Surveyor

STEGMAN, Harold F., 9518 Bruce Dr., Silver Spring, Md.—Cartographic Engineer, USC&GS

STEINLE, R. W., The Ohio Oil Co., Box 120, Casper, Wyo.—Head Draftsman

STEPHENS, Kenneth B., Route #2, Box 320, Scottville, Mich.—Land Surveyor

STIPOVICH, Richard B., 115 Edgewood Rd., Eureka, Calif.—Land Surveyor

STORRS, Philip N., 521 Curtis St., Berkeley, Calif. —Chief of Party, City of Alameda, Calif.

STRIBLING, J. N., Duke Power Co., P.O. Box 2178, Charlotte, N. C.—Division Engineer

STRONGOSKI, Joseph C., USGS, 1109 N. Highland St., Arlington, Va.—Surveyor

STUDER, John E., 42 Main St., Clifton, N. J.—Partner, Miers, Studer & McEldowney, Civil Engineers and Land Surveyors

SWINNEY, James B., 4814 San Marcos Pl., Los Angeles 42, Calif.—Licensed Land Surveyor, R. B. Huey, Co.

SYLAR, Roy M., 2521 Via Acosta, Montebello, Calif. —Supervisory Cartographer, USC&GS

TALLETT, James F., Rm. 21, City Hall, Clinton, Iowa—Asst. City Engineer, Clinton, Iowa

TANNER, Claude H., Jr., USGS, 1109 N. Highland St., Arlington, Va.—Cartographic Survey Aide

THOMA, Joseph C., Kidder & Thoma, 4811 Blagden Ave., N.W., Washington 11, D. C.—Civil Engineer and Surveyor

THOMAS, Wesley M., c/o R. M. Towill, 205 Merchant St., Honolulu, T. H.—Surveyor

TILMANS, Anthony, 324 Third Ave., New Kensington, Pa.—Surveyor, Aluminum Co. of America.

TOWILL, Henslee F., 219 Lycurgus Bldg., Hilo, Hawai, T. H.

TOWILL, Richard G., 407 Lawelawe St., Aina O Haina, Honolulu, T. H.

TRAINI, Felix P., 1235 E. 21st Ave., Columbus, Ohio—Asst. Engineer, New York Central R.R.

TRETHOW, Albert K., USGS, 1109 N. Highland St., Arlington, Va.—Topographic Engineer

VANDEMARK, Ernest S., President VanDemark & Lynch, Inc., 216 Pennsylvania Bldg., Wilmington, Del.—Surveyor and Civil Engineer

WAGNER, Charles P., Court House, Washington C. H., Ohio—Fayette County Engineer

WALDEMARSON, Earl W., R.D. #5, Box 154, Erie, Pa.—Surveyor and Transitman, Bureau of Engineering, City of Erie

WALKER, Lester R., USGS, Box 133, Rolla, Mo.—Topographic Surveyor

WHITE, H. M., Pafford, Jones & White, 5317 Hollywood Blvd., Hollywood 27, Calif.—Surveyor and Partner

WHITE, James G., Mississippi River Fuel Corp., 407 N. 8th St., St. Louis 1, Mo.—Chief Geologist

WHITTENBURG, W. R., P.O. Box 2418, Juneau, Alaska—Civil Engineer, U. S. Coast Guard

WICKNER, H. F., R. B. Huey Co., 408 S. Spring St., Suite 400, Los Angeles 13, Calif.—Survey Computer

WILLIAMS, Clifford T., 11 S. Pleasant St., Norwalk, Ohio—Engineer, The American Crucible Products Co.

WILLOUGHBY, Paul J., 49 W. Great Miami Blvd., Apt. 4, Dayton 5, Ohio—Surveyor Party Chief, Montgomery County Engineer's Office

WILSON, David F., 302 Grandview Ave., N.W., Canton, Ohio—Surveyor, Stark County Engineer

WITT, Joseph E., 4296 E. 71st St., Cleveland 5, Ohio—Consulting Engineer and Surveyor

WITTOUCK, Roy, 8433 Adoree St., Downey, Calif.

WONG, Tim, 923 Jackson St., San Francisco, Calif. —Cartographic Engineer, Corps of Engineers

WOOD, Ralph V., 223 Woodland Ave., Columbus, Ohio—Division Bridge Engineer, Ohio State Highway Dept.

LIBRARY MEMBERSHIP

FRED WITTNER ADVERTISING, 581 Fifth Ave., New York 17, N. Y.

Ancients Used Alcan Route

THE ROUTE of the Alaska Highway may, 9000 years ago, have been one of the roads down which Asian ancestors of American Indians traveled into North America.

Dr. Hugh Raup, botanist, and Frederick Johnson, anthropologist, think they have found evidence that this might have been the case at various places along the modern military road.

The two scientists figured that early North American man would have looked for the easiest route from Alaska south. This is just what engineers, faced with the same problem in the early days of World War II did. So the team dug for evidence along the Alaskan Highway.

The two scientists discovered a human culture in the Shakawk valley of southwestern Yukon—through which the Alaskan Highway runs—which gives every evidence of having spread in time throughout most of the period since the retreat of glaciers from the valley into the surrounding mountains.

This retreat, it has been determined, took place about the year 7000 B. C.

Most of the sites they found were buried in wind blown silts. From the nature of the silts, their depth and other geological facts, they were able to determine the times during which the tools were dropped or left there by those who made them.

Dr. Raup and Mr. Johnson found evidence of occupation at some 20 locations. Excavations were made at 11 of these. They uncovered hearths, some of which contained charcoal and scraps of burned bone. Tools were found in some instances, but in all cases they were extremely scarce.—*Science News Letter,* February 16, 1952.

SUSTAINING MEMBERS

ABRAMS INDUSTRIES, Lansing, Mich. { ABRAMS AERIAL SURVEY CORP. / ABRAMS INSTRUMENT CO. / ABRAMS AIRCRAFT CORP.

AERO SERVICE CORPORATION
236 East Courtland St., Philadelphia, Penna.

LAND TITLE COMPANY
First National Bank Bldg.
Anniston, Alabama

C. L. BERGER & SONS, Inc.
Precision Surveying & Astronomic Instruments
37 Williams St., Boston, Mass.

EUGENE DIETZGEN CO.
Surveying & Drafting Instruments & Supplies
Chicago—New York—San Francisco—New Orleans

THE A. LIETZ COMPANY
Manufacturer and Distributor of
Surveying and Drafting Instruments and Supplies
1224 South Hope St., Los Angeles, Calif.

SUSTAINING MEMBERS

GRANT PHOTO PRODUCTS, Inc.
(Formerly Grant Positype Corporation of America)
18915 Detroit Avenue, Cleveland, Ohio

W. & L. E. GURLEY
Engineering & Surveying Instruments
Troy, New York
(4 Memberships)

NORMAN G. HOUGH, SR.
Marchant Calculating Machine Co.,
1412 Eye St., N.W., Washington 5, D. C.

KEUFFEL & ESSER COMPANY
Drawing Materials & Surveying Instruments
Adams & Third Sts., Hoboken, N. J.

RAND McNALLY & COMPANY
Map Makers and Publishers
Chicago, Illinois
(2 Memberships)

HENRY WILD SURVEYING INSTRUMENTS SUPPLY CO. OF AMERICA, Inc.
26 Court St., Brooklyn, New York

SUSTAINING MEMBERS

R. M. TOWILL
Civil Engineer — Surveyor
Photogrammetry
205 Merchant St., Honolulu, Hawaii

GEO OPTIC CO.
2416 Atlantic Ave., Brooklyn 33, N. Y.
Surveying Instruments, Coordinatographs, Drawing Machines, etc.

HILGER & WATTS, LTD., LONDON, ENGLAND
Represented by
JARRELL-ASH COMPANY
165 Newbury St., Boston 16, Mass.

DIRECT REPRODUCTION CORPORATION
811–813 Union St., Brooklyn 15, N. Y.
Plastic Sheets for Drawings and Reproductions

W. J. ROBBINS & COMPANY
885 North LaSalle Street, Chicago 10, Ill.
Engineers and Land Surveyors Liability Insurance
Underwriters at Lloyd's, London

Membership Roster

American Congress on Surveying and Mapping

December 31, 1951

Membership Roster

American Congress on Surveying and Mapping

This roster includes members in good standing on December 31, 1951, according to the records of the Congress. Sustaining members, and new members who were admitted between January 1, 1952 and March 15, 1952, are shown elsewhere in this issue of the Journal. All members are urged to advise the Executive Secretary promptly of errors and omissions.

ALPHABETICAL LIST OF MEMBERS

HONORARY MEMBERSHIPS

COLBERT, Rear Adm. Leo Otis, 4408 29th St., N.W., Washington, D. C.

PETERS, Frederick Hathaway, 33 Main St., Aylmer East, P. Q., Canada

RANDALL, Robert H., Chief Examiner of Surveying and Mapping, Bureau of the Budget; 4009 East-West Highway, Chevy Chase 15, Md.

SANCHEZ, Dr. Pedro C., Director, Inst. Panamerican Da Geographia e Historia, Tacubaya, D. F., Mexico

SAYFORD, Ned H., Head of Maps & Surveys Division, Tennessee Valley Authority, Chattanooga, Tenn.

INDIVIDUAL MEMBERSHIPS

A

ABBOTT, Aubrey, P.O. Box 1282, Rome, Ga.

ABBOTT, Charles Baker, Homer, Alaska

ABBOTT, Clinton W. W., 4118 54th St., Sacramento, Calif.

ABBOTT, J. H., 801 Pine St., Crossett, Ark.

ABRAHAM, Naseem N., 4239 First St., S.E., Washington 20, D. C.

ABRAMS, Talbert, Abrams Aerial Survey Corp., 606 E. Shiawassee St., Lansing, Mich.

ACKERSON, Charles H., USGS, Box 133, Rolla, Mo.

ADAM, Harold E., USGS, Box 133, Rolla, Mo.

ADAMS, David Hugh, Shell Oil Co., Box 2099, Houston, Tex.

ADAMS, Rear Adm. K. T., 4103 N. Chesterbrook Rd., Falls Church, Va.

ADAMS, L. Mabry, Route #2, Cleburne, Tex.

ADAMS, Dr. Thomas C., 242 South, 12th East St., Salt Lake City 2, Utah

ADKINSON, Burton W., 5006 Baltimore Ave., Washington 16, D. C.

AGGELER, C. J., City College of San Francisco, San Francisco 12, Calif.

AGUERREVERE, Pedro I., Apartado 1253, Caracas, Venezuela

AIKIN, Henry B., Perkins Hall, Univ. of Tennessee, Knoxville, Tenn.

AIKMAN, C. F., 204 Welch Blvd., Flint, Mich.

AINSWORTH, Gordon Ellery, 2 Graves St., South Deerfield, Mass.

AIRES, Benjamin H., 410 First Ave., Pittsburgh 19, Pa.

AKKERMAN, W. H., Brazos Oil & Gas Co., 1401 City Natl. Bank Bldg., Houston 2, Tex.

ALBEAR, Jesus de, Calle 25 No. 160, Vedado, LaHabana, Cuba

ALEXANDER, Earl L., Surveyor's Office, La Porte, Ind.

ALEXANDER, Eugene G., USGS, Denver Federal Center, Denver, Colo.

ALEXANDER, Gerard L., Map Division, New York Public Library, Fifth Ave. & 42nd St., New York 18, N. Y.

ALI, Ahmin, Civil Engineering Dept., Ohio Univ., Athens, Ohio

ALLDREDGE, Kenneth B., P.O. Box 417, Grayville, Ill.

ALLEN, Boyd F., Tannersville, N. Y.

ALLEN, Stuart E., 6 W. Clark St., Milford, Conn.

ALLMAN, Harry C., Forest Protection Headquarters, Tomahawk, Wis.

ALLRED, Edgar L., USGS, Box 133, Rolla, Mo.

ALPAUGH, Walter A., USC&GS, Washington 25, D. C.

ALTENEDER, Theo. G., 1217 Spring Garden St., Philadelphia, Pa.

ALTENHOFEN, Robert E., 2504 N. Washington Blvd., Arlington, Va.

AMES, Arthur John, Instruments Ltd., 240 Sparks St., Ottawa, Ont., Canada

AMMANN, Jack, Ammann Photogrammetric Engrs., 829–831 N. St. Mary's St., San Antonio, Tex.

AMSTADT, John M., 5350 2nd St. N. Arlington, Va.

ANDERSON, Burton D., 3115 Campus Blvd., Albuquerque, N. Mex.

ANDERSON, C. Edwin, 66 Vernon St., Springfield 3, Mass.

ANDERSON, Czerny, Warner Springs, Calif.

ANDERSON, D. D., c/o Div. of Waterways, 201 W. Monroe St., Springfield, Ill.

ANDERSON, Edward M., P.O. Box 427, Champaign, Ill.

ANDERSON, George L., Capt., USC&GS, Washington 25, D. C.

ANDERSON, James H., 120 S. Spring St., Los Angeles, Calif.

ANDREGG, Charles H., 1582 East-West Highway, Silver Spring, Md.

ANDREGG, J. N., 1293 Lincoln Way, Auburn, Calif.

ANDREWS, Alvin P., P.O. Box 1206, Monroe, La.

ANDREWS, Edward G., P.O. Box 485, Wrens, Ga.

ANDREWS, G. S., Surveys & Mapping Service, Dept. Lands & Forests, Parliament Bldg., Victoria, B. C., Canada

ANGAS, Robert M., Robert M. Angas & Associates, 420 Hildebrandt Bldg., Jacksonville, Fla.

ANGELL, Clarence D., USGS, 1109 N. Highland St., Arlington, Va.

ANGELONI, William A., 1356 Geneva Ave., San Francisco 12, Calif.

ANGERMEIER, Robert, 32 W. Park St., Stockton 16, Calif.

ANGSTADT, Oren, 20 Park Lane, Pennside, Pa.

ANSON, Abraham, 99 Leesburg Pike, Falls Church, Va.

ANTREI, Albert C., Manti, Utah

ARCHIBALD, Samuel Wallace, P.O. Box 812, London, Ont., Canada

ARGYROPAIS, Lemonis, 1509 Rhode Island Ave., N.W., Washington 5, D. C.

ARLOSKY, Charles F., 4922 S. Chesterfield Rd., Arlington, Va.

ARMSTRONG, Charles T., 2616 Roosevelt Blvd., Midland, Tex.

ARNESON, Clair L., U. S. Forest Service, Potomac Station, Alexandria, Va.

ARNOLD, Charles H., 409 W. Third St., Little Rock, Ark.

ARUTA, Marco R., Alvin Aubinoe, Inc., Dupont Plaza, Washington, D. C.

ASH, Charles, 330 S. Charles St., Lima, Ohio

ASH, Stanley B., 310 Union Ave., Delanco, N. J.

ASHER, John E., c/o Gen. Petroleum Corp., 612 S. Flower St., Los Angeles 13, Calif.

ASK, Reynold E., 3900 N. 5th St., Arlington, Va.

ATHERTON, Tracy L., 925 Singingwood Rd., Sacramento 21, Calif.

ATHEY, H. E., Box 218, Wauneta, Nebr.

ATKINS, Charles R., USGS, 1109 N. Highland St., Arlington, Va.

ATKINSON, A. C., 1763 Radnor Rd., Cleveland Heights 8, Ohio

ATKINSON, Charles W., 3221 Montrose, Houston, Tex.

ATKINSON, E. S., 745 1st National Bank Bldg., Houston, Tex.

ATKINSON, Robert M., 745 1st National Bank Bldg., Houston, Tex.

AURNHAMMER, Walter L., Bassett Bldg., Summit, N. J.

AUSTIN, Jack S., USGS, Box 133, Rolla, Mo.

AUSTIN, Wilson, 144 W. River Rd., Olean, N. Y.

AVILA, Capt. Vicente, Avenida Colombia y Espinosa 200, Quito, Ecuador

B

BACHELLER, Martin A., 309 Windsor Rd., Woodridge, N. J.

BADGLEY, Ben O., 555 City Hall, Los Angeles 12, Calif.

BAGROWSKI, Benedict P., 59 Green Acres, Rolla, Mo.

BAILEY, A. Dyce, 807 S. Fourth, Pekin, Ill.

BAILEY, Allen Benjamin, USGS, Box 133, Rolla, Mo.

BAILEY, Donald G., 203 Summer St., P.O. Box 1326, Ojai, Calif.

BAILEY, Frank "Bill," c/o A. Lietz Co., 1224 S. Hope St., Los Angeles 15, Calif.

BAILEY, George D., 6952 Maple St., N.W., Washington 12, D. C.

BAILEY, Joe K., USGS, 1109 N. Highland St., Arlington, Va.

BAIN, James S., 940 Main St., Jacksonville 2, Fla.

BAIN, John R., Shocco Springs Rd., Talladega, Ala.

BAIRD, Charles O., Jr., Northeastern Univ., 360 Huntington Ave., Boston 15, Mass.

BAIRD, Walter E., 4002 Jefferson St., Hyattsville, Md.

BAKER, Maj. Charles A., 768 24th Ave., San Francisco 21, Calif.

BAKER, Gerald J., USGS, Box 133, Rolla, Mo.

BAKER, Michael, Jr., The Baker Engineers Bldg., Rochester, Pa.

BAKER, Quentin E., 2 Rolla Gardens, Rolla, Mo.

BAKER, Ralph W., Box 708, Big Spring, Tex.

BAKER, Prof. Wilfred H., 115 Mechanical Hall, West Virginia Univ., Morgantown, W. Va.

BALDWIN, Amos J. C., 117 W. Sunrise Hwy., Freeport, N. Y.

BALDWIN, Arnold M., Court House Annex, Santa Cruz, Calif.

BALDWIN, Marvin C., 207 Post Ave., Westbury, Nassau County, N. Y.

BALDWIN, Maurice E., 877 N. Perry St., Pontiac 16, Mich.

BALL, Fred A., CWO, 30th Engr. Topo. Bn., Ft. Winfield Scott, San Francisco, Calif.

BAMFORTH, Chester A., 101 Frank St., Norfolk, Va.

BANKS, Walton G., Engineering Surveys, Marlboro, Md.

BAPTIST, Alvin J., 2303 W. 134th Ave., San Leandro, Calif.

BARCLAY, Asst. Prof. Leland, Engineering Bldg. 177, Univ. of Texas, Austin, Tex.

BAREA, Salvador, Box 1023, Rio Piedros, Puerto Rico

BARKER, Fowler W., 17 Dupont Circle, Washington, D. C.

BARKLEY, Robert J. Hercules Powder Co., Delaware Trust Bldg., Wilmington, Del.

BARNES, James A., Prof., Dept. of Geology & Geography, Univ. of Georgia, Athens, Ga.

BARNES, Ralph C., 477 Court St., Salem, Oreg.

BARNHART, John H., Apt. 301, 3214 8th St., S.E., Washington 20, D. C.

BARRETT, Ernest W., 2208 Sixth Ave., Milwaukie, Oreg.

BARRETTE, Gerald, 53 Pere Marquette, Apt. 6, Quebec, Canada

BARRITT, Clifford L., USGS, Box 133, Rolla, Mo.

BARRY, B. Austin, Brother, Manhattan College, New York 71, N. Y.

BARSUGLI, Adolph J., 1420 Silver Lake Blvd., Los Angeles 26, Calif.

BARTEE, John H., 203 City Hall Bldg., Norfolk 10, Va.

BARTHOLD, Ed, USGS, 1109 N. Highland St., Arlington, Va.

BARTLETT, Ford, 38 E. Bayview Ave., Great Neck, N. Y.

BARTLETT, Homer N., 16 Briarcliff Dr., Port Washington, N. Y.

BARTLEY, Robert J., 128 W. Main St., Bay Shore, N. Y.

BARTMAN, Raymond C., Jr., USGS, P.O. Box 346, Sacramento 2, Calif.

BARTOL, Robert G., USGS, Box 133, Rolla, Mo.

BARTON, G. M., Box 143, Maumee, Ohio

BARTON, James C., Box 3537, Portland 8, Oreg.

BASHORE, Mrs. Mildred R., 4339 Harrison St., N.W., Washington 15, D. C.

BASKIN, J. P., P.O. Box 101, Rome, Ga.

BASNEY, Joseph N., 1438 Majestic Bldg., Detroit 26, Mich.

BATES, David F., 1810 Birchwood Dr., Salem, Oreg.

BATES, Frank J., Stuart Apts., Rolla, Mo.

BATHEY, Douglas, Bathey Mfg. Co., Plymouth, Mich.

BATSON, Wilbur C., USGS, Box 133, Rolla, Mo.

BATTEEN, Earl R., 808 E. 7th St., Rolla, Mo.

BATTY, John W., Surveys Inc., 14440 Victory Blvd., Van Nuys, Calif.

BAUER, S. A., 411 Union Bldg., 1836 Euclid, Cleveland 15, Ohio

BAUSCH, Carlton E., 43 Patten Ave., Oceanside, L. I., N. Y.

BAY, Helmuth, 1104 Natl. Press Bldg., Washington 4, D. C.

BAYLES, Carline McDonnell, 3444 Mt. Pleasant St., N.W., Washington 10, D. C.

BEACH, James C., P.O. Box 236, New Haven, Conn.

BEADLE, Ira C., County Surveyor, Papillion, Nebraska

BEAN, Harold A., USGS, Washington 25, D. C.

BEARDSLEY, Marion C., 295 N. 23rd St., Salem, Oreg.

BEATTY, F. W., 49 Southvale Dr., Toronto 17, Ont., Canada

BEAVIN, Benj. Everett, Sr., 331 E. Maple Rd., Linthicum Hts., Baltimore, Md.

BEAZLEY, Jon S., Div. of Research & Records, State Road Dept., Tallahassee, Fla.

BECK, Ellis L., Route #1, Box 202, Jeannette, Pa.

BECKLEY, Luther D., 166 Colorado Ave., Highland Park 3, Mich.
BECKTON, H. S., Corp. British Columbia Land Surveyors, 605 Courtney St., Victoria, B. C., Canada
BEDESEN, W. E., P.O. Box 391, Merced, Calif.
BEHRENS, Wm. H., 2616 C Ave., N.E., Cedar Rapids, Iowa
BEINHAUER, William, P.O. Box 725, Isleton, Calif.
BEISMAN, Henry E., 241 S. Plaza, Las Vegas, N. Mex.
BEITLE, Ralph L., USGS, 1109 N. Highland St., Arlington, Va.
BELGIAN MILITARY & AIR ATTACHÉ, 1771 Massachusetts Ave., N.W., Washington 6, D. C.
BELL, Gilbert A., 2032 Belmont Rd., Washington 9, D. C.
BELL, John, 53 Alfriston Rd., London S.W. 11, England
BELL, Robert L., Sylvania, Ga.
BELLAMY, Ben C., Box 37, Lamont, Wyo.
BELLERUE, Victor L., Fairchild Aerial Surveys, Inc., Room 4630, 30 Rockefeller Plaza, New York 20, N. Y.
BELOTE, Earl S., 641 Washington St., New York 14, N. Y.
BELTON, Richard J., USGS, Washington 25, D. C.
BENISH, Prof. Anthony A., Sunray Oil Corp., P.O. Box 2039, Austin, Tex.
BENKE, S. H., 15305 Huntmere Ave., Cleveland, Ohio
BENNETT, John F., Gulf Oil Corp., 1324 Gulf Bldg., P.O. Box 2100, Houston, Tex.
BENNETT, Joseph H., Chestnut St., Port Norris, N. J.
BERG, T. M., 656 N. Randall Rd., Aurora, Ill.
BERGER, Louis H., C. L. Berger & Sons, Inc., 37 Williams St., Boston, Mass.
BERGMAN, O. O., 522 Jefferson Ave., Sparta, Wis.
BERKLEY, Fred L., 6206 Norway Rd., Dallas 5, Tex.
BERMAN, Clarence A., 8000 Eastern Dr., Silver Spring, Md.
BERMEL, Peter F., 19 W. Monroe St., Colorado Springs, Colo.
BERNARD, A. E., N. Brewster Rd., Vineland, N. J.
BERRY, Col. Carl M., Box 38, Boeing Field, Seattle 8, Wash.
BERRY, Dick, L. L. Ridgway Co., 615 Caroline St., Houston, Tex.
BERRY, Jerome T., 1019 Lynwood Dr., Rolla, Mo.
BERRY, Maurice E., 1943 Hollywood Blvd., Hollywood, Fla.
BERRY, Paul P., USGS, Box 133, Rolla, Mo.
BERRY, Ralph Moore, 4230 Everett St., Kensington, Md.
BERRYMAN, William C., 1130 Pacific, Lansing 10, Mich.
BERTSCH, Robert E., USGS, Box 133, Rolla, Mo.
BESTOR, George C., P.O. Box 3045, Carmel, Calif.
BESWICK, Harvey W., 91 Park Ave., Allendale, N. J.
BETTS, Clifford Auil, Betts Engineering Co., 514 Lookout St., Chattanooga 3, Tenn.
BEYER, Herbert O., Teas & Steinbrenner, Bank Bldg., Malverne, N. Y.
BIEVER, Carl A., 3829 Franklin Blvd., Sacramento 20, Calif.
BIGGS, Arthur P., 4 Westwood Dr., Westmoreland Hills, Washington 16, D. C.
BINYON, Hugh A., West Coast Title Co., 526 Central Ave., St. Petersburg, Fla.
BIRDSEYE, Sidney H., 226 Dixie St., Elizabethtown, Ky.
BIRNBAUM, Harry, 915 E. 123rd St., Apt. 7, Cleveland 8, Ohio
BISEL, Ralph E., Box 1004, 10 Nantahala St., Badin, N. C.
BISHOP, Floyd A., Lander, Wyo.
BJORGUM, Kermit T., 123 S. Mill St., Fergus Falls, Minn.
BLACK, Dr. Lloyd D., 9111 Wire Ave., Silver Spring, Md.
BLACK, Ralph P., 858 Oakdale Rd., N.E., Atlanta, Ga.
BLACK, Roscoe J., 201 Montague St., Caro, Mich.
BLACKBURN, J. W., Kenbridge, Va.
BLAIN, Robert H., Glebe Rd., Easton, Md.
BLAKE, Paul, USGS, Denver Federal Center, Denver, Colo.
BLANCHARD, Robert, 82 Hillcrest Ave., Trenton 8, N. J.
BLANCHET, Jos., 72 Ste. Ursula St., Quebec, P. Q., Canada
BLANKENBAKER, Fisher F., USGS, 1109 N. Highland St., Arlington, Va.
BLASS, George, Baldwin, Mich.
BLEDSOE, C. C., Midwestern Engr. & Constr. Co., 105 N. Boulder, Tulsa, Okla.
BLEEKMAN, Prof. George M., 207 W. Engineering Bldg., Ann Arbor, Mich.
BLIZZARD, Douglas G., USGS, P.O. Box 346, Sacramento 2, Calif.
BLUCHER, Conrad M., 245 Rosebud, Corpus Christi, Tex.
BODDEKER, R. E., San Jacinto Blue Print Co., 1213 Fannin St., Houston, Tex.
BODEMER, Philip E., USGS, 1109 N. Highland St., Arlington, Va.
BOECKMAN, George O., M. S. M., Apt. R-2, Rolla, Mo.
BOEKENKAMP, Robert L., USGS, Box 133, Rolla, Mo.
BOGGS, Samuel Whittemore, Dept. of State, Washington, D. C.
BOHN, Jacob J., 137 Post Ave., Westbury, L. I., N. Y.
BOLDRIDGE, John, 505 S. East Street, Culpeper, Va.
BOND, Frank, Route 3, Box 412, Petaluma, Calif.
BOND, Frank C., 9 W. Putnam Ave., Greenwich, Conn.
BON DURANT, Edward V., USGS, 1109 N. Highland St., Arlington, Va.
BONHORST, Leonard W., Box 96, Pickstown, S. Dak.
BONNSTETTER, Gilbert A., 9839 Indiana Ave. S., Chicago 28, Ill.
BOON, Leonard F., 1617 E. River Terrace, Minneapolis 14, Minn.
BOOT, George W., 635 Richmondell Ave., Dallas 11, Tex.
BOOTH, Dr. Alfred W., Dept. of Geography, Univ. of Illinois, Urbana, Ill.
BOOTHE, Z. J., Jr., 425 Quitman St., San Antonio 8, Tex.
BORDEN, Capt. Frank S., 3611 Chesapeake St., N.W., Washington 8, D. C.
BORRIE, Alexander M., Borrie & McDonald, 972 McCarter Hwy., Newark, N. J.
BOSE, Comdr. J. C., 330 17th Ave., N.E., St. Petersburg, Fla.
BOUCHARD, Prof. Harry, 209 W. Engineering Bldg., Ann Arbor, Mich.
BOUDINOT, Allen R., 1015 19th Ave., Moline, Ill.
BOURGET, Albert, 40 Avenue des Braves, Quebec, P. Q., Canada
BOUTWELL, John Wesley, Jr., 25 Boston Ave., Takoma Park, Md.
BOUXSEIN, Isaac, Granville, Ill.
BOWER, William M., 816 W. 56th St., Los Angeles 37, Calif.
BOWMAN, D. A., Route 9, Greeneville, Tenn.
BOYCE, Russell Ivan, Boyce Engineering Associates, 152 N. Main St., Wallingford, Conn.
BOYD, Morris J., 8515 N.E. Tillamook St., Portland 20, Oreg.
BOYD, R. P., 21½ S. Barstow, Eau Claire, Wis.
BOYLES, J. Stuart, 601 Stewart Bldg., Houston 2, Tex.
BRAATEN, Norman F., USC&GS, Washington 25, D. C.

BRACEWELL, Joseph R., Sr., Buckhead Theatre Bldg., Atlanta, Ga.
BRADY, Stanley B., 1615 Spencer St., P.O. Box 508, Rolla, Mo.
BRAMMELL, James A., 3428 Fairhill Dr., S.E., Washington, D. C.
BRANDT, Edward Dupree, Humble Oil & Refg. Co., P.O. Box 2180, Houston, Tex.
BRANSFORD, Prof. T. L., 1636 N.W. 7th Ave., Gainesville, Fla.
BRAUCHER, Samuel L., 42 Carlton St., Sodus, N. Y.
BRAUND, John J., 900 Alabama Ave., S.E., Washington 20, D. C.
BRAWLEY, A. L., P.O. Box 37, Harvey, La.
BRAWNER, William M., P.O. Box 31, Paragould, Ark.
BREED, Prof. Charles B., 1-370, M. I. T., Cambridge 39, Mass.
BREHMER, Herbert H., Suttons Bay, Mich.
BRELICK, Joseph, 1704 R St., S.E., Washington 20, D. C.
BREVER, Marvin H., 1606 Pine St., Rolla, Mo.
BREW, A. Norman, USGS, 1109 N. Highland St., Arlington, Va.
BRIDGES, Clarence E., 4232 Y St., Sacramento 17, Calif.
BRIENZA, Paul I., City Hall, Mount Vernon, N. Y.
BRIERLY, A. A., County Surveyor, Independence, Calif.
BRIERLY, Dr. William B., 2007 Woodberry St., West Hyattsville, Md.
BRIGGS, Roy, 76 Forest View Dr., San Francisco, Calif.
BRINKER, Prof. Russell C., Head, C. E. Dept., V. P. I., Blacksburg, Va.
BRITAIN, K. E., Tennessee Gas Transmission, 115 Beverly Lane, Bellaire, Tex.
BRITCHER, Karl E., 3012 Cresmont Ave., Baltimore 11, Md.
BRITTON, G. C., Imperial Oil Limited, Rm. 403, Production Dept., 56 Church St., Toronto, Ont., Canada
BRIZARD, Alex, 738 Fifth St., Eureka, Calif.
BROCK, Hobart M., 209½ Sanders Bldg., Clinton, Tenn.
BROCK, James E., Britt Rd., P.O. Box 1103, Stuart, Martin, Fla.
BROCKWAY, George S., 404 Guaranty Bldg., West Palm Beach, Fla.
BROOKS, Harold R., 2627 Evarts St., N.E., Washington 18, D. C.
BROSHOT, Arthur E., USGS, Box 133, Rolla, Mo.
BROWN, Art. H., Pier 2, Pratt St., Baltimore 2, Md.
BROWN, Arthur L., c/o Steinkamp Co., 1219 Yonkers Ave., Yonkers, N. Y.
BROWN, Arthur W., P.O. Box 659, Salt Lake City, 9, Utah
BROWN, Edward B., Commander, USC&GS, Washington 25, D. C.
BROWN, Homer, 223 Hammond, San Antonio, Tex.
BROWN, Joe L., #7 Green Acres, Rolla, Mo.
BROWN, Lloyd Arnold, 5902 Ayleshire Rd., Baltimore 12, Md.
BROWN, Merrill A., East St., Carlisle, Mass.
BROWN, W. N., 3420 Newark St., Washington, D. C.
BROWN, Warren R., USGS, P.O. Box 346, Sacramento 2, Calif.
BROWN, Whitmell Clark, 6 Aaron St., Martinsville, Va.
BROWN, William W., Jr., 507 E. 14th St., Rolla, Mo.
BROWNE, Joseph J., Jr., 1727 E. Ocean View Ave., Norfolk 3, Va.
BROWNLEE, John H., Houston Lighting & Power Co., Electric Bldg., Houston, Tex.
BRUBAKER, Jay I., USGS, 1109 N. Highland St., Arlington, Va.
BRUCE, Robert H., USGS, P.O. Box 346, Sacramento 2, Calif.
BRUDER, Wallace A., USC&GS, Washington 25, D. C.
BRUNO, Everett W., USGS, Box 133, Rolla, Mo.
BRUNSON INSTRUMENT CO., 1405 Walnut St., Kansas City 6, Mo.
BRUSH, D. V., Box 109, R.D. #2, Verona, Pa.
BUCHANAN, W. Franklin, 405 Main St., Metuchen, N. J.
BUCK, Ross W., 605 Volunteer Bldg., Atlanta, Ga.
BUCK, William N., USGS, P.O. Box 346, Sacramento 2, Calif.
BUCKEY, Charles W., USGS, 1109 N. Highland St., Arlington, Va.
BUCKMASTER, J. L., USGS, Washington 25, D. C.
BUDNICK, Morris, USGS, 1109 N. Highland St., Arlington, Va.
BUETTNER, Arman J., 407 Tenth St., N.W., Washington, D. C.
BULLARD, Edward F., USGS, 1109 N. Highland St., Arlington, Va.
BULLIS, M. O., Commonwealth Edison, Rm. 825, 72 W. Adams St., Chicago, Ill.
BULTON, Eugene D., 307½ California Ave., Modesto, Calif.
BUMSTEAD, Newman, National Geographic Society, 16th & M Sts., N.W., Washington 6, D. C.
BUNCH, F. M., Mississippi State Highway Dept., Tupelo, Miss.
BUNKER, Harold, P.O. Box 37, Merrick, N. Y.
BURBANK, Donald S., 143 Tomahawk Dr., Avon Lake, Ohio
BURGENER, Harry J., Sr., 1959 E. Clay St., Decatur, Ill.
BURGESS, Roy A., Main St., P.O. Box 147, Carmel, N. Y.
BURKART, William J., The Atlantic Refining Co., P.O. Box 2819, Dallas, Tex.
BURKE, Forrest M., Kumquat Lane, Portuguese Bend via Palos Verdes Estates, Calif.
BURNETT, Ernest, Shell Oil Co., Box 2099, Houston, Tex.
BURNEY, Irving M., 10 Monroe St., New York 2, N. Y.
BURNS, Joseph P., 124 S. Virginia Ave., Falls Church, Va.
BURT, J. R., P.O. Box 730, Trenton, N. C.
BURTON, Stanley G., 4006 Natasha Dr., Lafayette, Calif.
BURTON, W. A., 803 E. Fourth St., Mt. Pleasant, Tex.
BUSH, Harold L., 1616 Gordon St., S.W., Atlanta, Ga.
BUSKIRK, Paul Van, Huron-Clinton Metropolitan Authority, 1750 Guardian Bldg., Detroit 6, Mich.
BUSSELL, Conrad T., 234 N. Granada St., Arlington, Va.
BUTLER, E. S., 408 Archer St., Houston 9, Tex.
BUTLER, Joe, Fla. State Rd. Dept., P.O. Box 1499, Ft. Lauderdale, Fla.
BUTTERWORTH, Herbert L., DeWitt, Va.
BUXTON, John E., 902 Wallace Bldg., Little Rock, Pulaski, Ark.
BYRD, W. O., 129 Arden Rd., Columbus 14, Ohio

C

CABRAL, Dr. Edison, Servicos Aerofotogrametricos Cruzeiro do Sul, Av. Pasteur 429, Rio de Janeiro, Brazil
CAESAR, Arthur M., Henry Wild Surv. Instrument Sup. Co., 26 Court St., Brooklyn, N. Y.
CAHN, Charles A., 82 Audobon St., New Haven, Conn.
CALAHAN, Pecos H., 948 Bethany Rd., Burbank, Calif.
CALVACHE, Antonio D., Instituto Cartografico Nacional, Ministerio de Agricultura, Havana, Cuba
CAMERON, Theodore F., USGS, P.O. Box 346, Sacramento 2, Calif.
CAMP, Rufus S., 210 Gell St., Salinas, Calif.
CAMP, W. E., Purdue Univ., West Lafayette, Ind.
CAMPBELL, William R., USGS, P.O. Box 346, Sacramento 2, Calif.

CANDELA, Joseph, 1530 Columbus Ave., Ashtabula, Ohio
CANFIELD, James B., USGS, Box 133, Rolla, Mo.
CANNON, Samuel C., Municipal Bldg., Main St., Middletown, Conn.
CANOVA, Carlos Fenwick, Sr., Canova Beach R.F.D., Melbourne, Fla.
CANTRELL, Terence B., 15460 Stout Ave., Detroit 23, Mich.
CAREY, Kyran P., 3513 Idaho Ave., N.W., Washington 16, D. C.
CAREY, Robert J., USGS, 1109 N. Highland St., Arlington, Va.
CAREY, Roy E., USGS, Box 133, Rolla, Mo.
CAREY, Walter, 159 Manning Ave., River Edge, N. J.
CARMICHAEL, Paul J., USGS, Box 133, Rolla, Mo.
CAROTHERS, Lee E., Route #1, Pineville, N. C.
CARPENTER, J. C., Fairfax Hotel, 2100 Massachusetts Ave., N.W., Washington, D. C.
CARPENTER, Lee B., Box 34, Waverly, Va.
CARR, G. V., 1045 Talbotton Rd., Columbus, Ga.
CARR, Capt. George P., Third Logistical Command, APO 973, c/o Postmaster, San Francisco, Calif.
CARR, J. Revell, 12 Church Circle, Annapolis, Md.
CARR, L. P., 8019 Hartford St., Houston, Tex.
CARROLL, Joel, USGS, Washington 25, D. C.
CARROLL, John, Topog. Survey Bur. G & T. Dept. Mines, Tempo. Bldg. 8, Carling Ave., Ottawa, Ont., Canada
CARROLL, Roger M., 376 Mountain Ave., North Plainfield, N. J.
CARTER, Ed. E., R. D. Carter Engineering Co., Vero Beach, Fla.
CARTER, F. W., 659 E. Main St., Brownsville, Tenn.
CARTER, R. V., 702 Hamilton St., Williamsburg, Va.
CASAS, Lt. Col. Manuel Llanos, Manuel Castaneda 116, Lima, Peru
CASEY, John T., 68 Main, P.O. Box 60, Ware, Mass.
CASSELL, Frank B., Pennsylvania Water & Power Co., Holtwood, Pa.
CASSELL, George W., State Rd., Comm., 307 Tower Bldg., Baltimore, Md.
CASSISTA, Andre, 111 Mountain Hill, Quebec, P. Q., Canada
CASTILLO, Dr. Carlos Jose del, Quinta Elba, Avenida la Estrella, San Bernardino, Caracas, Venezuela
CASTRO G., Alberto, Av. Miraflores 215, Barranco, Lima, Peru
CATLETTE, Monte C., 315 Professional Bldg., Charleston, W. Va.
CAUVIN, Amilcar, Pont Morin—Bois Verna, Port-au-Prince, Haiti, W. I.
CAVIN, W. Marsh, Stanley, N. C.
CAYCE, Thomas W., USGS, 1109 N. Highland St., Arlington, Va.
CHABEK, A. R., V. M. Clarke Engrg. Co., 4050 Brookpark Rd., Cleveland 9, Ohio
CHAMBERS, Robert H., R.F.D. #4, Rockville, Conn.
CHAN, Harry Charles, USGS, P.O. Box 346, Sacramento 2, Calif.
CHANCE, John E., Sun Oil Co., P.O. Box 1060, Lafayette, La.
CHANG, Wen-han, 830 N. St. Mary's St., San Antonio 2, Tex.
CHAPIN, Edward L., Jr., Geography Dept., Univ. of Calif., Los Angeles 24, Calif.
CHAPMAN, Stanley P., P.O. Box 193, New Orleans 3, La.
CHAPMAN, William H., USGS, P.O. Box 346, Sacramento 2, Calif.
CHAPPELL, W. G., Dinwiddie, Va.
CHASE, Benjamin P., 86 Center St., Dennisport, Mass.
CHASE, Heman, Alstead, N. H.
CHAUVIN, Emile J., c/o U. S. Military Attaché, Port-au-Prince, Haiti
CHENEY, Frank L., 103 Hillcrest Rd., Needham 92, Mass.
CHERRY, Alonzo L., U. S. Engineer Office, P.O. Box 119, Norfolk 1, Va.
CHESEBROUGH, Samuel A., USGS, Box 133, Rolla, Mo.
CHILDREE, Linney Leonidas, Donalsonville, Ga.
CHILDS, Wm. F., Jr., Maryland State Roads Comm., 108 E. Lexington St., Baltimore 3, Md.
CHILSON, J. Walter, 33 Fales St., Franklin, Mass.
CHITTENDEN, Hiram M., Prof., Dept. of Civil Engineering, Univ. of Washington, Seattle, Wash.
CHLEBICKI, George J., 15304 Center Ave., Harvey, Ill.
CHOPE, Irvin E., 11742 Bramell St., Detroit 28, Mich.
CHRISTENSON, James A., 373 Central St., Mansfield, Mass.
CHURCH, Earl, Prof., Parish, N. Y.
CHURCH, Jack P., USGS, P.O. Box 346, Sacramento 2, Calif.
CHUTE, Gordon L., USGS, 1109 N. Highland St., Arlington, Va.
CHUTE, Kenneth M., USGS, 1109 N. Highland St., Arlington, Va.
CHYPAK, Jaroslav, 2 School St., Passaic, N. J.
CISSNA, Volney J., Jr., 1105 Lynwood Dr., Rolla, Mo.
CLARIDGE, Rev. George C., St. Norbert College, West De Pere, Wis.
CLARK, Arch, Sun Oil Co., Box 2880, Dallas 1, Tex.
CLARK, B. S., Jr., R.F.D. #5, Lexington, Va.
CLARK, Charles W., Lt. Comdr., USC&GS, Washington 25, D. C.
CLARK, Ellis W., c/o Crossett Lumber Co., Crossett, Ark.
CLARK, Prof. George W., 165 N. Congress St., Athens, Ohio
CLARK, Merrill W., USGS, Box 133, Rolla, Mo.
CLARK, Warren W., Clark & Groff Engineers, 3245 S. Commercial St., Salem, Oreg.
CLARKE, Cyril G., 161-10 Jamaica Ave., Jamaica, N. Y.
CLARKE, Vincent B., 356 Main St., Ansonia, New Haven County, Conn.
CLAUSEN, Elmer L., Clausen & Co., Rm. 1619, 228 N. LaSalle St., Chicago 1, Ill.
CLAWSON, Maj. Earl M., P.O. Box 1525, Orlando, Fla.
CLEMENT, Robert L., 250 Fulton Ave., Hempstead, N. Y.
CLEMENTS, E. Staley, Jr., 1606 Georgia Ave., Richmond, Va.
CLEVELAND-CLIFFS IRON CO., Geological Dept., 504 Spruce St., Ishpeming, Mich.
CLOSE, F. Perry, 49 Pearl St., Hartford, Conn.
CLUTE, Harold M., Box 2056, Kansas City 13, Mo.
COBB, Dow C., P.O. Box 203, Jourdanton, Tex.
COCKEY, Vinton D., Washington Ave., Laurel, Md.
COGGIN, Harry L., Sr., 1509 S. West St., Falls Church, Va.
COGLIANDRO, Richard J., 179 Lincoln Ave., Mineola, N. Y.
COGSWELL, A. R., P.O. Box 25, Jacksonville, Fla.
COHEN, Philip M., 1439 Oglethorpe St., N.W., Washington 11, D. C.
COKER, C. P., 3835 Spring Park Rd., Jacksonville, Fla.
COLBERT, Rear Adm. Leo Otis, 4408 29th St., N.W., Washington, D. C.
COLE, M. B., Houston Blue Print & Sta. Co., 140 Esperson Bldg., Houston, Tex.
COLLICT, Kenneth, 52 Hill St., Rockaway, N. J.
COLLIER, Rob M., USGS, Box 133, Rolla, Mo.
COLLIER, Susan E., 3606 16th St., N.W., Washington, D. C.
COLLINS, John G., 2248 Marconi Ave., Sacramento 15, Calif.
COLLINS, Robert S., 1741 Gaylord St., Denver 6, Colo.

COMPAGNON, Henri, 4832 W. 137th St., Hawthorne, Calif.
COMSTOCK, Robert D., Sr., 1601 E. Gonzalez St., Pensacola, Fla.
CONANT, Louis C., USGS, Northington Campus, University, Ala.
CONDRA, Charles E., P.O. Box 27, New Albany, Ind.
CONDRA, Ralph J., 4921 Romaine St., Los Angeles 29, Calif.
COOK, Caneth W., C. W. Cook Corp., 8459 Melrose Ave., Los Angeles 46, Calif.
COOK, J. W., 409 Thiesen Bldg., Pensacola, Fla.
COOK, Lt. Marshall M., 3128 Parkway Terrace Dr., S.E., Washington 20, D. C.
COOK, Norman T., c/o Socony-Vacuum Oil Co., Apartado 246, Caracas, Venezuela
COOKE, R. J., 210 N. Adams St., East Tawas, Mich.
COOMBS, Albert H., 4417 49th St., N.W., Washington 16, D. C.
COON, Emmett J., 411 S. Bryant St., Denver 9, Colo.
COOPE, Albert, Court House, Market St., Youngstown, Ohio
COOPER, Daniel C., 246 Charles St., Watertown, N. Y.
COOPER, Josiah S., Jr., USGS, P.O. Box 346, Sacramento 2, Calif.
COOPER, Ousby L., Box 668, South Hill, Va.
COOPER, Wallace A., Div. of Beaches & Parks, 1211 16th St., Sacramento, Calif.
COPLEY, J. W., 753 Willa Dr., Decatur, Ga.
CORDES, Jacob H., 117 N. Broadway, Havana, Ill.
CORN, Lawrence H., USGS, 1109 N. Highland St., Arlington, Va.
CORNELIUS, John D., 117 W. Sunrise Highway, Freeport, N. Y.
CORNITIUS, Leonard E., Houston Lighting & Power Co., Box 1700, Houston, Tex.
CORTRIGHT, Asst. Prof. Donald N., Box 130, Washington Univ., St. Louis, Mo.
COTE, Daniel N., 926 Urban Ave., Durham, N. C.
COTE, Georges, Quebec Dept. Lands & Forests, Parliament Bldgs., Quebec, P. Q., Canada
COULTER, Don M., Box 811, Miami, Okla.
COUTINHO, Prof., Joaquim de Siqueira, 1890 Ontario Pl., N.W., Washington 9, D. C.
COVERDALE, Miles E., Delaware State Hwy. Dept., 1709 Lancaster Ave., Wilmington, Del.
COWELL, Joseph G., 18 Duvall St., Washington 20, D. C.
COX, David, Jr., Hertford, N. C.
COX, Seth R., USGS, P.O. Box 346, Sacramento 2, Calif.
CRANGLE, Dale E., USGS, Box 133, Rolla, Mo.
CRAWFORD, Thomas W., U. S. Bureau of Land Management, 1245 N. 29th St., Billings, Mont.
CRAWFORD, W. A., College Park, Staunton, Va.
CREATH, Norris B., Box 1600, Midland, Tex.
CREPEAU, Armand, P.O. Box 659, Sherbrooke, P. Q., Canada
CRISMAN, Lewie R., P.O. Box 350, Selma, Ala.
CROCKETT, Vernon P., Liberty Bldg., Sheffield, Ala.
CROLEY, Eugene R., 4618 Allendale Ave., Oakland, Calif.
CROLEY, J. M., 5710 Yupon St., Bellaire, Tex.
CROSS, Dick L., USGS, P.O. Box 346, Sacramento 2, Calif.
CROSS, Garth M., Box 375, Manhattan Beach, Oreg.
CROSSER, Robert E., 5th Floor, Civil Courts Bldg., Houston, Tex.
CROTWELL, S. P., County Surveyor, Leesburg, Ga.
CROUCH, Glenn O., 3481 Sierra View Lane, North Sacramento 15, Calif.
CROWELL, H. G., USGS, Box 133, Rolla, Mo.
CROWTHER, George, 2429 N. Fillmore St., Arlington, Va.
CRUISE, R. B., Gulf States Utilities Co., Box 2951, Beaumont, Tex.
CRUMP, Warren C., 4837 16th St., N.E., Washington 17, D. C.
CUBBAGE, James M., P.O. Box 784, Point Marion, Pa.
CUCURULLO, Oscar, Jr., Apartado Postal 943, Ciudad Trujillo, Dominican Republic
CUDE, William C., 7 Fort Hunt Rd., Alexandria, Va.
CUMBOW, A. L., Jr., P.O. Box 305, Abingdon, Va.
CUMMINS, Thomas V., USGS, Denver Federal Center, Denver, Colo.
CUNNEA, Joseph P., 3712 W. 62nd Pl., Chicago, Ill.
CURLEY, John P., 665 Newark Ave., Jersey City, N. J.
CURRAN, John Edward, Rm. 203, Title Insurance Bldg., Reno, Nev.
CURTIS, Kenneth S., Civil Engrg. Dept., Purdue Univ., Lafayette, Ind.
CURTIS, Robert V., 401 Pound Bldg., Chattanooga, Tenn.
CURTIS, William D., Arnold Mills, R.F.D., Valley Falls, R. I.
CUSHING, Bernard F., 641½ N. High St., Salem, Oreg.
CUSTIDERO, Louis R., 6018 Ninth Rd. N., Arlington, Va.
CYVAS, Vladas, 1303 E. 68th St., Cleveland 3, Ohio

D

DAILY, Wendell T., Engr. Dept., 7th Floor, City Hall, Oakland, Calif.
DALE, Ralph E., 5344 Murdoch, St. Louis 9, Mo.
DALEY, R. K., Stanolind Oil & Gas Co., P.O. Box 3092, Houston 1, Tex.
D'ANDREA, Rocco V., 1139 Boston Post Rd., Riverside, Conn.
DANIEL, Robert L., Box 955, Hammond, La.
DANIELL, Wilson Forrest, The Texas Co., 3611 Sunset Blvd., Houston 5, Tex.
DANIELS, Albert W., 2375 San Diego Ave., San Diego 10, Calif.
DARBY, Harold A., 35 S. Raymond Ave., Pasadena, Calif.
DARNELL, Roy C., USGS, 1109 N. Highland St., Arlington, Va.
DAUGHETEE, Evert E., 719 N. Birmingham, Tulsa, Okla.
DAVEY, Charles H., 23 Baltimore Ave., Takoma Park 12, Md.
DAVIDSON, John I., 9017 Lindale Dr., Bethesda 14, Md.
DAVIES, Charles H., USC&GS, Washington 25, D. C.
DAVIES, William E., 125 W. Greenway Blvd., Falls Church, Va.
DAVIS, Allan D., Route 4, Box 252, Cumberland, Md.
DAVIS, Dale V., c/o Chas. H. Swift Co., Box 1087, Dodge City, Kans.
DAVIS, Jesse Z., USGS, P.O. Box 346, Sacramento 2, Calif.
DAVIS, John M., 150 Newell Ave., St. Clairsville, Ohio
DAVIS, Prof. Raymond E., 202 Engrg. Materials Lab, Univ. of California, Berkeley, Calif.
DAVIS, Robert O., USGS, Denver Federal Center, Denver, Colo.
DAVIS, William S., 2712 Crest Ave., Cheverly, Md.
DEAN, Donald H., 408 California Fruit Bldg., Sacramento, Calif.
DEAN, Minor E., P.O. Box 1429, Jackson, Miss.
DEANE, Lt. Comdr. William F., Dept. of Obsn., The Artillery School, Fort Sill, Okla.
DEARDORF, Kenneth R., 3040 Idaho Ave., N.W., Apt. 626, Washington 16, D. C.
DEBEAU, Edwin B., 15 Thorne Ave., Hempstead, N. Y.
DEBRUIN, William E., 266 Fulton Ave., Hempstead, L. I., N. Y.
DEEG, James J., 101 Lewiston Rd., Dayton 9, Ohio
DEGNAN, Laurence V., 394 Twelfth Ave., San Francisco 18, Calif.
DEGROVE, Russell H., 420 Hildebrandt Bldg., P.O. Box 358, Jacksonville 2, Fla.

DEHLINGER, Martin Emery, 1101 Eleventh Pl., Big Spring, Tex.
DEILLER, Harold E., 29 Derwent Ave., Verona, N. J.
DEILY, Earle A., Commander, USC&GS, Washington 25, D. C.
DEININGER, Charles E., 117 Gedney Rd., Trenton 8, N. J.
DELANCEY, John B., P.O. Box 236, North East, Md.
DELANEY, Albert E., 116 Victoria Rd., Burlingame, Calif.
DELANEY, Maurice S. A., 208 Williamsburg Dr., Silver Spring, Md.
DELL, George H., 201 Eng. Hall, Univ. of Ill., Urbana, Ill.
DEMAREST, L. B., 17 Wakefield Pl., Caldwell, N. J.
DEMATTOS, Dr. Allyrio H., Est. Jequitiba, 23—Gavea, Rio de Janeiro, Brazil
DEMLER, Lester E., 25 Tilley Ave., Pompton Plains, N. J.
DENAULT, Milton F., USGS, 1109 N. Highland St., Arlington, Va.
DERR, C. W., Derr Map Studio, 401 Merrill Ave., Rockford, Ill.
DESMOND, W. E., Jr., St. Paul, Va.
DETJEN, Richard F., 100 S. Elm St., Rolla, Mo.
DEWEY, Robert C., USGS, P.O. Box 346, Sacramento 2, Calif.
DICK, R. G., 15 Baroda St., Wellington, New Zealand
DICKSON, George M., Box Elder, Mont.
DICKSON, John H., 8 Harriet Court, Sea Cliff, N. Y.
DIERCKS, Lt. Col. F. O., Quarters 15, Fort Belvoir, Va.
DIETZGEN, Joseph E., 1216 Willow Rd., Winnetka, Ill.
DIGGORY, Mark L., 11 Beechwood Dr., Glen Head, N. Y.
DILL, Henry, 189 Montague St., Brooklyn, N. Y.
DILL, Philip A., 3810 Gwynn Oak Ave., Baltimore 7, Md.
DINGMAN, Lester F., USGS, Washington 25, D. C.
DINGMAN, Robert O., 34 Maple St., Palmer, Mass.
DINNIN, Mrs. Leona C., P.O. Box 346, USGS, Sacramento 2, Calif.
DIRECTOR OF SURVEYS, Kingston, Jamaica, B. W. I.
DISHER, Quentin F., 12 Lafayette Pl., Woodmere, L. I., N. Y.
DITTMER, Russell S., P.O. Box 1164, Chattanooga, Tenn.
DIX, Walter S., 809 Town House Apt., 601 19th St., N.W., Washington 6, D. C.
DIXON, George, Route 1, Box 48, Gurnee, Ill.
DOBBIN, John V., 1736 18th St., N.W., Washington 9, D. C.
DOBBINS, Jesse D., USGS, 1109 N. Highland St., Arlington, Va.
DODD, Orrin E., U. S. Forest Service, Potomac Station, Alexandria, Va.
DOFFLEMYER, Clyde E., 5735 4th St., N.W., Washington 11, D. C.
DOLLENBERG, Fred H., 709 Washington Ave., Towson 4, Md.
DONAGHUE, John P., 265 Nugent St., St. Paul, Minn.
DONAHEY, Walter L., 138 Center St., St. Marys, Pa.
DONAHOE, John T., Public Works Dept., Building 275, U. S. Navy Yards, Brooklyn, N. Y.
DONAN, John G., 60 E. Center St., Madisonville, Ky.
DONKER, Russell F., 158 Bostwick St., N.E., Grand Rapids, Mich.
DONOVAN, T. L., Sinclair Petroleum Co., P.O. Box 51, Dire Dawa, Ethiopia
DORAN, Philip C., Commander, USC&GS, Washington 25, D. C.
DORNHOEFER, Louis, 10959 110th St., Ozone Park 16, N. Y.
DORNIER, Felix L., Jr., Shell Oil Co., Land Dept., Houston, Tex.
DORSEY, Jerome E., City Hall, Los Angeles, Calif.
DOSCHER, George E., Jr., 513 Beachwood Blvd., Beachwood, N. J.
DOUGALL, Matthew, L. A. County Flood Control District, 5308 Chesley Ave., Los Angeles 43, Calif.
DOYLE, Frederick J., International Training Centre for Aerial Survey, Kanaalweg 3, Delft, Netherlands
DRAKE, John H., USGS, 1109 N. Highland St., Arlington, Va.
DROUGHT, F. T., 117 W. Pecan St., San Antonio, Tex.
DRUHOT, George Stanley, 4506 Jones Bridge Rd., Bethesda 14, Md.
DUDLEY, Edgar Earl, E. Phil Harris Co., 125 S. 68th St., Birmingham 6, Ala.
DUERKSEN, J. A., 3134 Monroe St., N.E., Washington, D. C.
DUMAS, Armand, 805 Royal St., P.O. Box 90, Malartic, P. Q., Canada
DUMBLE, Charles S., 234 Olive St., Bakersfield, Calif.
DUNBAR, Marion F., Box 74, Morgantown, W. Va.
DUNICH, Joseph P., 10220 Day St., Kensington, Md.
DUPUY, Edmond P., 1823 Arthur St., Philadelphia 15, Pa.
DURHAM, Jean H., 2500 Bolsover Rd., Houston 5, Tex.
DURKIN, John J., 104 Commonwealth Ave., Alexandria, Va.
DUTRA, William Edward, P.O. Box 1124, Newark, Calif.
DUVALL, J. W., 67 Rolla Gardens, Rolla, Mo.
DYE, Leon A., 2111 C & I Life Bldg., Houston 2, Tex.
DYER, Ben, 3018 Hamilton St., Hyattsville, Md.
DYER, James T., USGS, Denver Federal Center, Denver, Colo.
DYER, Jesse C., USGS, Denver Federal Center, Denver, Colo.

E

EAKES, J. Chandler, County Surveyor, Jonesboro Heights, Sanford 8, N. C.
EARLE, Robert A., Commander, USC&GS, St. Petersburg, Fla.
EARLE, Truman R., 1116½ N. Western Ave., Los Angeles 29, Calif.
EARNEST, G. Brooks, Dean of Engineering, Fenn College, Cleveland 15, Ohio
EASTMAN, Robert F., County Engineer, County Bldg., Springfied, Ohio
ECKERSON, S. J., General Drftg. Co., 21 West St., New York 6, N. Y.
ECKHARDT, Clifford V., Route 6, Box 3509, Sacramento, Calif.
ECKLUND, C. A., USGS, P. O. Box 346, Sacramento 2, Calif.
EDIN, Ralph J., 212 Plaza Court, Oklahoma City 3, Okla.
EDMONSTON, Harold R., 2800 Quebec St., Apt. 955, Washington 11, D. C.
EDWARDS, Malcolm B., 1119 Water St., South Bend, Wash.
EDWARDS, Robert C., 210 Morris St., Morristown, N. J.
EGNER, Prof. Carl A., 1308 Ravinia Rd., West Lafayette, Ind.
EGOLF, Harry L., Jr., 203 Tiburon Blvd., San Rafael, Calif.
EHMAN, Jack D., 898 Humble Bldg., Houston 1, Tex.
EHRHARDT, W. E., Box 191, Baytown, Tex.
EICHLER, John O., Prof., Cooper Union, Cooper Square, New York 3, N. Y.
EINARSON, Reynir, USGS, Box 133, Rolla, Mo.
EISENHARDT, William C., USGS, P.O. Box 346, Sacramento 2, Calif.

EISENMAN, Francis T., Jr., Eisenman Engineering Co., 6605 Iris Dr., Hollywood 28, Calif.
EKBLAW, Dr. George E., 216 Natural Resources Bldg., Urbana, Ill.
ELDER, E. K., P.O. Box 418, Albuquerque, N. Mex.
ELDRIDGE, Winfield, Jr., USGS, P.O. Box 346, Sacramento 2, Calif.
ELIEL, Leon T., Fairchild Aerial Surveys, 224 E. 11th St., Los Angeles, Calif.
ELKINS, Frank S., 1400 N. Buchanan St., Arlington, Va.
ELLEDGE, William C., USGS, Box 133, Rolla, Mo.
ELLER, Robert C., USGS, Washington 25, D. C.
ELLIOTT, Robert T., 4029 Gilmore Ave., Cincinnati 9, Ohio
ELLIS, Lewis L., 207 Gold Professional Bldg., Wilson, N. C.
ELLIS, Warren T., 10611 Lockridge Dr., Silver Spring, Md.
ELROD, Loren E., 26 South Dr., Decatur, Ill.
EMBRY, W. S., Embry Surveying Co., P.O. Box 29, Alice, Tex.
EMERY, Serge A., 169 E. 2nd St., New York 9, N. Y.
EMMICK, E. F., 432 N. Division, Olympia, Wash.
EMMINIZER, Granville K., 1233 Patapsco St., Baltimore, Md.
ENFIELD, John, Calif. Eng. & Surv. Service, 12th and F Sts., Marysville, Calif.
ENGEN, Gilbert A., Apt. 12, 2000 H St., N.W., Washington 6, D. C.
ERB, Rowland W., 1210½ 7th Ave., Neptune, N. J.
ERICKSON, Philip C., USGS, P.O. Box 346, Sacramento 2, Calif.
ESBAUGH, Clifford W., Dept. Civil Engineering, Missouri School of Mines, Rolla, Mo.
ESLINGER, Thomas R., 110 Willamette Ave., Medford, Oreg.
ESPENSHADE, Assoc. Prof. Edward B., Jr., University Hall, Northwestern Univ., Evanston, Ill.
ESPY, J. Stanley, Frostburg, Md.
ESTOCK, J. K., Jr., 1011 Jersey St., Wylam, Birmingham 8, Ala.
EUBANK, B. J., 2056 Chippewa St., Baton Rouge, La.
EUBANKS, Reuben W., 110 S. Walker St., Rolla, Mo.
EVANS, Arthur R., 748 S. Pine St., Roseburg, Oreg.
EVANS, Cornelius C., P.O. Box 285, Lavallette, N. J.
EVANS, John A., USGS, Box 133, Rolla, Mo.
EVANS, Richard T., 1368 Euclid St., N.W., Apt. 34, Washington 9, D. C.
EVERETT, George H., 513 Dartmouth Ave., Silver Spring, Md.
EVERS, William E., P.O. Box 284, Deer Park, L. I., N. Y.
EWELL, William H., Bureau of Highways, 306 Municipal Bldg., Baltimore 2, Md.
EWING, John C., Shell Oil Co., P.O. Box 2099, Houston 1, Tex.
EYMAN, Assoc. Prof. Raymond P., 4701 Connecticut Ave., N.W., Washington 8, D. C.

F

FAIR, Wm. H., Jr., 354 S. Spring St., Rm. 826, Los Angeles 13, Calif.
FAIRCLOUGH, William Thomas, 125 Grove St., Reading, Mass.
FAIRFIELD, George A., Denton Bldg., Mineola, N. Y.
FALL, Lloyd W., 1438 Majestic Bldg., Detroit 26, Mich.
FARAM, Sidney W., 1518 Hollywood Ave., Chicago 26, Ill.
FARMER, John L., USGS, P.O. Box 346, Sacramento 2, Calif.
FARMER, Sam D., USGS, Box 133, Rolla, Mo.
FARNHAM, Charles S., 211 Norton St., New Haven, Conn.
FARQUE, Claude W., 805 W. 8th Ave., Crossett, Ark.
FARRAR, A. K., County Surveyor, Centerville, Miss.
FARRELL, Gordon, Dept. Works & Hydraulics, San Fernando, Trinidad, B. W. I.
FARRELL, Robert J., 257 N. Thomas St., Arlington, Va.
FARRELL, William H., USGS, P.O. Box 346, Sacramento 2, Calif.
FARRINGTON, Evan G., USGS, P.O. Box 346, Sacramento 2, Calif.
FASSETT, Rex E., Box 2031, Balboa Hts., Canal Zone
FAXAS, Antonio Aguilar, Oquendo 362, Altos, Habana, H., Cuba
FEARHEILEY, Richard P., 223 W. 5th St., Mt. Carmel, Ill.
FEINDT, Mrs. Mary C., Box 18, Charlevoix, Mich.
FENNELL, Earle J., USGS, Washington 25, D. C.
FENTON, John V., 410 Morris Ave., Rockville Centre, N. Y.
FERGUSON, Lewis K., WO (jg), Sv. Btry., 194 F. A. Bn., Camp McCoy, Wis.
FERGUSON, M. L., M. L. Ferguson Map Co., 112 Dwyer Ave., San Antonio 5, Tex.
FERGUSON, Regis C., USGS, 1109 N. Highland St., Arlington, Va.
FERGUSON, Roy Francis, P.O. Box 506, Rolla, Mo.
FERNANDEZ, Fernando Moya, Alajuela, Costa Rica
FERREN, Peter N., M. Sgt., U. S. Army Mission to Bolivia, c/o United States Embassy, La Paz, Bolivia
FETTERS, Bevan D., Route 5, Celina, Ohio
FIEBELMAN, Jacob P., Box 605, Rolla, Mo.
FINCH, John D., USGS, Box 133, Rolla, Mo.
FISH, Gilbert R., Commander, USC&GS, Washington 25, D. C.
FISHER, David, c/o Pusom, 30 Rte. de Mediouna, Casablanca, French Morocco
FISHER, James R., USGS, Box 133, Rolla, Mo.
FITZGERALD, Col. Gerald, 7203 Summit Ave., Chevy Chase 15, Md.
FITZGERALD, John R., USC&GS, Washington 25, D. C.
FITZPATRICK, Henry Vaughan, 807 Forsyth Bldg., Atlanta, Ga.
FLACH, Victor H., U. S. Forest Service, Portland, Oreg.
FLEEMAN, Roy, Pineville, Ky.
FLEMING, Luther C., Southwestern Blue Print Co., 1801 Commerce St., Dallas 1, Tex.
FLINT, George M., Jr., USGS, Washington 25, D. C.
FLORES, Octavio, Maj., Regimiento "Chacabuco," Concepcion, Chile
FLOYD, Benny, 2421 36th St., Longview, Wash.
FLUENT, Craig H., 2012 Mulberry St., Harrisburg, Pa.
FOGG, Patricia L., USGS, P.O. Box 346, Sacramento 2, Calif.
FOLLOWILL, Richard J., 1900-B N. Walnut, Rolla, Mo.
FOLMAR, James M., Folmar-Flinn Corp., P.O. Box 12, Montgomery, Ala.
FONFARA, Edward W., 6904 Barton Rd., Radiant Valley, Hyattsville, Md.
FONG, Toon Y., USGS, P.O. Box 346, Sacramento 2, Calif.
FOOTE, Prof. Francis S., 2601 Shasta Rd., Berkeley 8, Calif.
FORD, DuWard G., 302 N. Cameron, Victoria, Tex.
FORD, Glendon H., 11208 Huston St., North Hollywood, Calif.
FORD, Harry S., Washington Suburban Sanitary Comm., 4017 Hamilton St., Hyattsville, Md.
FOSTER, E. J., P.O. Box 694, Laredo, Tex.
FOSTER, Fred W., Assoc. Prof., Dept. of Geography, Univ. of Illinois, Urbana, Ill.
FOSTER, John H., 12 S. 3rd St., Richmond 19, Va.
FOWLER, James G., 1327 Bath St., Santa Barbara, Calif.
FOX, Tom, Jr., 2093 Louis Rd., Palo Alto, Calif.

FRAENZA, William A., USGS, P.O. Box 346, Sacramento 2, Calif.
FRANK, Ted. C., 23 Story Court, Bayonne, N. J.
FRANKENFIELD, Howard B., Jr., P.O. Box 1103, Tryon, N. C.
FRAY, William C., 110 Woodside Ave., Bridgeport 6, Conn.
FREDRICKS, J. Henry, USGS, P.O. Box 346, Sacramento 2, Calif.
FREEDMAN, Barnett D., 1749 S.W. 3rd Ave., Miami, Fla.
FREEMAN, J. D., 3001 Bridle Path, Austin 3, Tex.
FREEMAN, Philip D., 4901 Colley Ave., Norfolk, Va.
FREEMAN, Wm. F., Wm. F. Freeman Engineers, Inc., 116½ E. Commerce St., High Point, N. C.
FRENCH, James H., USGS, Box 133, Rolla, Mo.
FRENCH, Roscoe J., 3921 Elbert Ave., Alexandria, Va.
FRESEN, E. C., 193 Hart St., New Britain, Conn.
FREW, Robert L., 1503 28th St., N.W., Washington 7, D. C.
FRIERSON, Robert E., 710 Pound Bldg., Chattanooga, Tenn.
FRIPP, Harry M., County Surveyor, Walterboro, S. C.
FROMMHOLZ, Hans E., Yorktown Heights, N. Y.
FUECHSEL, Charles F., USGS, Washinngton 25, D. C.
FULLER, E. W., Chicago Aerial Survey Co., 332 S. Michigan Ave., Chicago 4, Ill.
FULLER, Homer C., 3411 29th St., N.W., Washington 8, D. C.
FULLERTON, C. S., 28 N. St. Clair St., Painesville, Ohio
FULTON, William J., 2607 Parliament Bldgs., Toronto, Ont., Canada
FUNK, L. L., P.O. Box 841, San Luis Obispo, Calif.
FURR, Jake M., Jr., Troy Hotel, Troy, N. C.

G

GABEL, William H., 1300 Schuyler Rd., Beverly Hills, Calif.
GACKE, Robert J., 518 N. Super St., Houston, Tex.
GADDY, Joseph H., Box 102, Newburg, Mo.
GAEDEN, Harold J., 1755 Van Ness Ave., San Francisco 9, Calif.
GAINER, Charles E., 312 Rosamond, Maumee, Ohio
GALLIMORE, H. C., F. A. Pease Engineering Co., 2063 E. 4th St., Cleveland 15, Ohio
GANN, Irving T., Sr., 6615 Cleon Ave., North Hollywood, Calif.
GARBER, Marvin L., 113 D Huskerville, Lincoln, Nebr.
GARDNER, Fred W., 1310 Main Ave., Clifton, N. J.
GARDNER, Homer M., County Highway Supt., Austin, Ind.
GARDNER, M. L., USGS, P.O. Box 346, Sacramento 2, Calif.
GARDNER, Robert N., USGS, P.O. Box 346, Sacramento 2, Calif.
GARMANY, H. M., P.O. Box 1831, Savannah, Ga.
GARNER, Capt. Clement L., 3400 McKinley St., N.W., Washington 15, D. C.
GARNETT, V. S., P.O. Box 1482, Monroe, La.
GATZERT, Clifford, P.O. Box 24, Lodi, Calif.
GAUSMANN, R. W., 405 W. 23rd St., New York 11, N. Y.
GAY, Harry Scott, 1702 Honaker Ave., Princeton, W. Va.
GEBHART, Bernard R., 227 N. Mill St., Celina, Ohio
GEE, Daniel J., 622 University Ave., Walla Walla, Wash.
GEHRES, Wilmer S., 1804 N. Elm St., Rolla, Mo.
GEHRKE, Randall F., 1719 Patterson Rd., Dayton 10, Ohio
GELDERN, Edward Von, 430 2nd St., Yuba City, Calif.
GEMUNDER, D. K., 11 Ladd & Bush Bank Bldg., Salem, Oreg.
GEORGE, Floyd Clinton, Gamle Gade #28, P.O. Box 571, Charlotte Amalie, St. Thomas, V. I.
GEORGE, Vernon D., 2223 R St., S.E., Washington 20, D. C.
GERBER, R. G., Box 1271, Corpus Christi, Tex.
GERLACH, Dr. Arch C., Map Division, Library of Congress, Washington, D. C.
GERNERT, Carl R., U. S. Engineers, 721 33rd Ave., South, Seattle 44, Wash.
GERSTER, George F., 130 S. Garfield St., Arlington, Va.
GERVAIS, Arthur, Jr., USGS, Denver Federal Center, Denver, Colo.
GEUDER, Norman O., 2599 Grand Ave., Chicago 12, Ill.
GEURIN, Johnnie W., USGS, Box 133, Rolla, Mo.
GHENT, Victor H., Box 903, Route 1, Annandale, Va.
GIBB, Joseph B., County Surveyor, Accomac, Va.
GIBBON, Lacy P., R.F.D. 1, Box 237-A, Forest Park, Ga.
GIERHART, John W., 120 24th Pl. East, Eugene, Oreg.
GILBERT, R. E., 1203 Central Ave., Albany, N. Y.
GILCHRIST, Claude F., Jr., 1004 Houston Ave., Takoma Park, Md.
GILLESPIE, Berkeley S., Wise Engineering Co., Big Stone Gap, Va.
GILLESPIE, Wylie W., P.O. Box 1048, Jacksonville, Fla.
GINTER, Edwin L., USGS, Box 133, Rolla, Mo.
GIOIOSA, Albert A., 105 Lucas Lane, Bethesda, Md.
GLASS, Richard A., R.R. #2, Box 104, Indianapolis, Ind.
GLASSBERG, Hugh I., 6609 Clarenden Rd., Bethesda 14, Md.
GLEASON, Walter Blackwell, R.F.D. #3, Box 232, Fairfax, Va.
GLEISSNER, Max J., USGS, Box 133, Rolla, Mo.
GLENN, E. S., Box 568, Carthage, Mo.
GLOVER, Norman O., 323 First St., Woodland, Calif.
GOAD, Marjorie, The Bamolja Co., 18½ N.W. Sixth St., Evansville 8, Ind.
GOBLE, William C., 39 17th Ave., East Paterson, N. J.
GODFREY, Elizabeth M., 2150 Pennsylvania Ave., N.W., Washington 7, D. C.
GODLEWSKI, Klemens, 146 Holland Rd., London, W. 14, England
GOEBL, Alois J., 1704 Northview Rd., Rocky River, Ohio
GOETZE, Klaus F., 6616 Leland Way, Los Angeles 28, Calif.
GOGGIN, John P., Marathon, Fla.
GOLDMAN, Martin, County Court House, Youngstown, Ohio
GOLDSMITH, Woodrow W., Box 584, Mt. Airy, N. C.
GOLUB, Harvey, Alaska Road Commission, Juneau, Alaska
GOMOLKA, Eugene G., USGS, 1109 N. Highland St., Arlington, Va.
GORDON, Austin R., 6 Tansey Dr., Falls Church, Va.
GORDON, James B., 725 Ellis St., San Francisco, Calif.
GORDON, Ray, 1575 Washington Ave., Miami Beach 39, Fla.
GORNITSKY, Raymond, 6807 Riggs Rd., Hyattsville, Md.
GOSEN, John W., USGS, Box 133, Rolla, Mo.
GOSSETT, Franklin R., Commander, USC&GS, Washington 25, D. C.
GOSSETT, James Alfred, 52 W. Clinton St., Danville, Ind.
GOUCHENOUR, Edward W., USGS, Box 133, Rolla, Mo.
GOULD, Franklin P., Crivitz, Wis.
GOULD, Samuel, Jr., County Engineer, Court House, Youngstown, Ohio

GOVE, John R., Box 1182, Chapel Hill, N. C.
GRAFF, J. Edwards, Associated Consulting Engineers, 1606 Kelly Ave., Baltimore 9, Md.
GRAHAM, A. D., County Courthouse, Salem, Oreg.
GRAHAM, Benjamin H., 967 Harrison St., Monterey, Calif.
GRAHAM, Charles R., 5228 Chevy Chase Parkway, N.W., Washington 15, D. C.
GRAHAM, J. H., Box 9, London, Ky.
GRAHAM, John P., P.O. Box 1249, Houston 1, Tex.
GRAMBO, Amos S., Bonneville Power Adm., P.O. Box 3537, Portland, Oreg.
GRANT, Joe, Socony-Vacuum Oil Co., Apartado 246, Caracas, Venezuela
GRANT, Joe L., Route 3, Bunting Dr., North Augusta, S. C.
GRANT, U. S., U. S. Grant & Son, 831 State St., Santa Barbara, Calif.
GRAPES, Sgt. Howard E., Dept. of Observation, TAS, Ft. Sill, Okla.
GRAVEL, Jacques, 14 Fabric St., Quebec, P. Q., Canada
GRAVELLE, Warren G., Route 4, Box 415, Chico, Calif.
GRAY, Edward J., 16 Arnold Pl., Norwich, Conn.
GRAY, Ernest S., 4225 Bayard, San Diego 9, Calif.
GREATHOUSE, Wayne C., 3017 Medway St., Silver Spring, Md.
GREEN, Jackson D., 533 Harrison Ave., Roselle, N. J.
GREEN, William W., 3149 Topeka St., Corpus Christi, Tex.
GREENAWALT, Norman E., 1024 Knoll Dr., Falls Church, Va.
GREENE, Dwight L., 4507 Conifer Lane, Parkwood, Washington 14, D. C.
GREENGARD, Charles W., 8541 S. St. Lawrence Ave., Chicago 19, Ill.
GREENUP, Wilbur E., 1049 W. Broadway, Eugene, Oreg.
GREENWALD, George A., 2021 S. Grand Ave., Los Angeles 7, Calif.
GREENWOOD, Charles O., Jr., 2704 Florence Pl., Sacramento, Calif.
GREENWOOD, Harold E., USGS, Box 133, Rollo, Mo.
GREEVER, John J., Route #1, Box 145, Melbourne, Fla.
GREGG, Aubrey B., P.O. Box 6721, Roswell, N. Mex.
GREGG, Ferrell L., 3630 W. Alice Pl., Denver, Colo.
GREGORY, Arthur Van Ness, 1955 E. 93rd St., Cleveland 6, Ohio
GREGORY, Henry W., 433 Main St., Stamford, Conn.
GRIBOK, Peter, 408 Johnson Rd., Tyler Park, Falls Church, Va.
GRIFFIN, Edna Marjorie, 910 Erie Ave., Takoma Park 12, Md.
GRIFFIN, Irving M., Jr., 2445 Stanmore Dr., Houston 19, Tex.
GRIFFITH, Shirley V., USC&GS, Washington 25, D. C.
GRIMES, Edward G., 103 Allan Rd., Yorktowne Village, Washington 16, D. C.
GRIMM, Kenneth B., Jr., 713 Jefferson St., Fairfield, Calif.
GRIMM, Lloyd E., USGS, Box 133, Rolla, Mo.
GRIMM, William W., 5724 Kenneth Ave., Carmichael, Calif.
GRINNELL, William Phillips, Sr., Havens & Emerson—Consulting Engrs., 6508 Lexington Ave., Suite 3, Cleveland 3, Ohio
GROTE, William F., 1620 W. Pikes Peak Ave., Colorado Springs, Colo.
GROTHAUS, Fred E., 415 Lewis St., San Antonio 1, Tex.
GROVER, John F., 3585 Merrick Rd., Seaford, N. Y.
GROW, George S., c/o Engrg. & Development Assoc., 1915 Peachtree Rd., N.W., Atlanta, Ga.
GRUNELL, Gilbert B., 3721 30th St. N., Arlington, Va.
GUENZEL, W. T., 4418 Stanford St., Houston, Tex.
GUINN, Robert F., Nevada Dept. of Highways, Carson City, Nev.
GULA, Michael J., 18 Cist St., Buttonwood, Wilkes-Barre, Pa.
GULLA, Carl, 11541 Mt. Carmel Rd., Cleveland 4, Ohio
GUNBY, Ralph A., USGS, P.O. Box 346, Sacramento 2, Calif.
GUTHE, Dr. Otto E., 3015 Albemarle St., N.W., Washington 8, D. C.
GUTIER, E. Chris, 18320 Arminta St., Reseda, Calif.
GUTIERREZ, Ofimiano J., USGS, P.O. Box 346, Sacramento 2, Calif.
GUY, Briscoe B., 1603 Cherokee Rd., Richmond 25, Va.

H

HAAS, Charles W., USGS, 1109 N. Highland St., Arlington, Va.
HAASE, P., Levstraede 8, Copenhagen, Denmark
HACKER, Theodore W., 1304 St. Paul St., Baltimore 2, Md.
HADDAWAY, James E., Wyoming, Del.
HAIN, E. L., 1236 Pinecrest Circle, Silver Spring, Md.
HAINES, Prof. D. Don, Rm. 14, Marvin Hall, Univ. of Kansas, Lawrence, Kans.
HAINES, Wilford N., Drain, Oreg.
HAJAS, Eugene S., 506 Jennings Rd., Fairfield, Conn.
HALBROOK, Quincy X., USGS, P.O. Box 346, Sacramento 2, Calif.
HALE, John S., Box 961, Staunton, Va.
HALL, Harold S., USGS, Box 133, Rolla, Mo.
HALL, Harvey J., USGS, P.O. Box 346, Sacramento 2, Calif.
HALL, Hugo J., 1865 7th Ave., Sacramento, Calif.
HALL, M. W., 633 Telfair St., Augusta, Ga.
HALL, Robert D., 1228 S. Jackson St., Green Bay, Wis.
HALL, Walter H., Idaho Dept. of Highways, P.O. Box 789, Pocatello, Idaho
HALLERT, Bertil, Prof., Institute of Technology, Stockholm 26, Sweden
HALLMARK, Nelson T., 2516 1st Rd. N., Arlington, Va.
HALVORSON, Albert R., Austin Engineering Co., Inc., 115 S. Jefferson Ave., Peoria, Ill.
HAMBRICK, James H., Box 384, Rainelle, W. Va.
HAMILTON, Mrs. Barbara A., USGS, P.O. Box 346, Sacramento, Calif.
HAMKE, Robert F., General Delivery, Danville, Ky.
HAMMON, Alonzo C., 4192 Wilshire Blvd., Oakland 2, Calif.
HAMMOND, Leighton S., 11277 Richland Ave., Los Angeles 64, Calif.
HAMNER, Dyson S., 2218 Burbank Blvd., Burbank, Calif.
HAMPTON, Ambrose G., 3131 Sussex Rd., Raleigh, N. C.
HAMPTON, William J., Jr., 417 Hardwick St., Belvidere, N. J.
HANLON, Joseph A., Box 37, Maple View, N. Y.
HANNA, Walter J., Jr., 314 First St., Gilroy, Calif.
HANRAHAN, Vincent J., 10025 Lorain Ave., Silver Spring, Md.
HANSON, Cecil E., 990 Mesa Verde Rd., Pasadena, Calif.
HANSON, Gustav. A., 81 North St., Torrington, Conn.
HARDEN, Milton J., USGS, Box 133, Rolla, Mo.
HARDING, Charles E., USGS, Box 133, Rolla, Mo.
HARDING, George H., Mapping and Charting Research Lab., Ohio State Univ., 2593 Hardin Rd., Columbus, Ohio
HARDY, George D., c/o Michael Baker Engrs., P.O. Box 1429, Jackson, Miss.
HARDY, Rolland L., 3213 Jocelyn St., N.W., Washington 15, D. C.

HARMEL, Melvin A., Denver Federal Center, Denver, Colo.
HARPSTER, Robert A., Rm. 200, Abr. Savings & Loan Bldg., Aberdeen, Wash.
HARRELL, Grady S., Committee of Land Surveyors, Route 1, Shannon, N. C.
HARRINGTON, Earl G., Bureau of Land Management, Interior Bldg., Washington 25, D. C.
HARRIS, Millard H., Alabama Power Co., 600 N. 18th St., Birmingham 2, Ala.
HARRIS, W. C. "Bus," County Surveyor, Greenville, Mo.
HARRISON, Richard Edes, 313 E. 51st St., New York 22, N. Y.
HART, David L., USGS, Box 133, Rolla, Mo.
HART, Fred M., USGS, Washington 25, D. C.
HARTMAN, Prof. Paul, 5 Marjorie Court, Teaneck, N. J.
HARVEY, Castle J., Deep Rock Oil Corp., Atlas Life Bldg., Tulsa, Okla.
HARVEY, Francis K., 99 N. Front St., Columbus 15, Ohio
HARVEY, James H., 1738 34th Ave., San Francisco, Calif.
HARVEY, Lewis S., P.O. Box 366, 600 N. 2nd St., Harrisburg, Pa.
HARVEY, M. S., Consumers Power Co., 212 Michigan Ave. W., Jackson, Mich.
HARVEY, Robert B., Jr., P.O. Box 6095, Milan Station, Norfolk 8, Va.
HARWOOD, John E., Dept. of Highways, 1221 E. Broad St., Richmond 19, Va.
HARWOOD, Julius, Frank E. Towle & Son, Inc., 258 Broadway, New York 7, N. Y.
HASELWOOD, Robert W., Box 115, Alturas, Calif.
HATCHER, Rolla V., Hatcher Engineering & Drafting Service, 3221 Montrose, Houston, Tex.
HATHORN, Stanley J., 3020 S. Buchanan St., Apt. B-1, Arlington, Va.
HAUPT, Lt. (jg) Richard W., USS Maury (AGS 16), Fleet Post Office, New York, N. Y.
HAVRE, Gertrude, 1812 Irving St., N.W., Washington 10, D. C.
HAWKEN, C. C., P.O. Box 101, Winterville, Ga.
HAWKINS, Herman P., P.O. Box 572, Port Jefferson, L. I., N. Y.
HAWKINS, Irvin J., 511 N. Washington St., Salem, Mo.
HAWKINS, Joseph Washburn, 135 Rose Ave., Sebring, Fla.
HAWKINS, Louis M., P.O. Box 174, Fort Worth, Tex.
HAYES, Henry H., 635 St. Paul St., Rochester 2, N. Y.
HAYNE, H. M., State Lands Sec., Dept. Pub. Works, State Capitol, Baton Rouge, La.
HAZARD, Thomas A., Ryall Engr. Co., 5th Avenue Hotel, Fairbanks, Alaska
HEALEY, Howard A., 150 Pingree St., Detroit 2, Mich.
HEBB, Lyle E., Box 399, Bassett, Nebr.
HEFFNER, Irvin R., 235 North St., Emmaus, Pa.
HEIDT, Mack, Midwestern Geophysical Lab., 1st National Bank Bldg., Julesburg, Colo.
HEINRICHS, Christian C., c/o General Geophysical Co., General Delivery, Aransas Pass, Tex.
HELLER, Kenneth J., 2nd & Oxford Sts., Coopersburg, Pa.
HELLMAN, W. M., Lt., USC&GS, Washington 25, D. C.
HELM, Ludwig, Hq. USFA Statistical Branch, APO 168, c/o Postmaster, New York, N. Y.
HEMPLE, Capt. H. W., 5712 Nevada Ave., N.W., Washington 15, D. C.
HENDERSON, Russell S., Jr., Aero. Chart Infor. Center, Moses Bldg., 11th & F Sts., N.W., Washington, D. C.
HENDRICKSON, Leo H., USGS, Denver Federal Center, Denver, Colo.
HENDRICKSON, Milton C., U. S. Bureau of Reclamation, P.O. Box 307, Elverta, Calif.
HENNING, George D., County Surveyor, Roscommon, Mich.
HENNINGSEN, J. N., USGS, Box 133, Rollo, Mo.
HENRY, Laurence O., 1226 12th St. N., Fargo, N. Dak.
HENSLEY, Paul, 413 Roswell St., Smyrna, Ga.
HERBELL, C. P., Sanborn Map Co., 629 Fifth Ave., Pelham, New York 65, N. Y.
HERR, Charles R., Prof., Pasadena City College, 1570 E. Colorado St., Pasadena 4, Calif.
HERRERA, Anfiloquio Level, Caracas 1622, Venezuela
HERZOG, G. W., 3735 Darcus St., Houston 5, Tex.
HEWITT, H. R., R. 1, Box 93 B, Winnabow, N. C.
HICKS, Herbert S., 1416 Granger, Ann Arbor, Mich.
HICKS, James D., County Surveyor, Court House, Annapolis, Md.
HICKS, Joe A., Jr., Houston Lighting & Power Co., P.O. Box 1700, Houston, Tex.
HICKS, William T., 87 Fernwood Terrace, Stewart Manor, N. Y.
HIGBEE, Lester C., W. & L. E. Gurley Co., 514 Fulton St., Troy, N. Y.
HIGGINS, Donald L., 60 N. Peach St., Medford, Oreg.
HILL, Charles E., R.D. 3, Mexico, N. Y.
HILL, Clair A., 1525 Court St., P.O. Box 558, Redding, Calif.
HILL, Meredith E., 6519 77th St., Cabin John, Md.
HILL, Ray H., 2360 Hernando Rd., Sacramento 15, Calif.
HILL, William B., Jr., 212 Dixie Ave., Wilmington, N. C.
HILLBERG, Col. L. J., Dept. of M. T. & G., USMA, West Point, N. Y.
HILLMAN, E. A., Signal Oil & Gas Co., 2501 E. Willow, Long Beach 6, Calif.
HILTON, Thomas Earl, 214 S. Fairmont, Tyler, Tex.
HINELY, J. A., c/o 549th Engr. Base Survey Co., Glamis, Calif.
HIPPLER, Bernard E., 1511 State St., Rolla, Mo.
HIRSCH, Emanuel, 100 Ireland Pl., Amityville, L. I., N. Y.
HITCHINGS, Allen, Gardner & Hitchings, Inc., 609 Arctic Bldg., Seattle 4, Wash.
HOAG, Albert L., Gen. Engrg. Dept., Univ. of Washington, Seattle 5, Wash.
HOBSON, Delbert A., R.R. #2, Mooresville, Ind.
HODGE, Merton, Unionville, Conn.
HODGESON, Herbert H., 916 45th St., Sacramento 19, Calif.
HOEFT, Franklin R., Route 2, Box 52, Princeton, Minn.
HOFF, Clarence W., 1201 S. 8th St., Springfield, Ill.
HOFFBUHR, J. A., Box 178, Route #3, Medford, Oreg.
HOFSTRAND, Harold L., 6219 Goodrich Ave., St. Louis Park, Minn.
HOGAN, Earl M., USGS, P.O. Box 346, Sacramento 2, Calif.
HOKE, William B., 403 Municipal Office Bldg., Baltimore 2, Md.
HOLL, Richard C., 513 71st St., Seat Pleasant 19, Md.
HOLLAND, Edward S., 316 S. Washington St., Alexandria, Va.
HOLLAND, Lt. Col. Elwood W., 616 Novelda Rd., Alhambra, Calif.
HOLLIS, Elmer Y., Jr., Kentucky Dept. of Highways, 317 S. 21st St., Paducah, Ky.
HOLLOWAY, Cedric F., 802 E. 6th St., Rolla, Mo.
HOLMES, Benjamin O., Maps & Surveys Div., TVA, Chattanooga, Tenn.
HOLMES, John H., Harrisville, Mich.
HOLMQUIST, J. H., 2419 Yonge St., Rockford, Ill.
HOLSTEN, Wendell L., 51 Fisk Dr., Newington, Conn.
HOOKS, J. M., 1175 State St., N.W., Atlanta, Ga.

HOPE, E. S., Prof. American University of Beirut, Beirut, Lebanon
HOPKINS, H. C., 750 E. Colorado St., Pasadena 1, Calif.
HOPKINS, Page F., 8506 Dixon Ave., Silver Spring, Md.
HOPTRY, Richard A., USGS, P.O. Box 346, Sacramento 2, Calif.
HORN, Egmont, 37 Brinkerhoff Ave., Freehold, N. J.
HORNBY, A., 34 Victoria Rd., Marrickville, N. S. W., Australia
HORNE, Capt. Roland D., 2570 Westwood Blvd., Los Angeles 64, Calif.
HORTON, Philip Z., 211 Fulton St., Peoria, Ill.
HOSHIDE, Toshio, 12911 Valleywood Dr., Silver Spring, Md.
HOSKINSON, Albert J., Capt., USC&GS, Washington 25, D. C.
HOSOKAWA, Kenji, USGS, P.O. Box 346, Sacramento 2, Calif.
HOUDLETTE, Elmer C., Survey Div., Mass. Dept. Pub. Works., 100 Nashua St., Boston 14, Mass.
HOUGH, Floyd W., Army Map Service, 6500 Brooks Lane, Washington 16, D. C.
HOUGH, Norman G., Sr., 1412 Eye St., N.W., Washington 5, D. C.
HOUSHOLDER, E. Ross, 433 E. Spring St., Kingman, Ariz.
HOUSMAN, Bert, USGS, 1109 N. Highland St., Arlington, Va.
HOWARD, Frank Z., 208 Willits Bldg., Klamath Falls, Oreg.
HOWARD, James F., 940 Main St., Jacksonville, Fla.
HOWARD, John E., R. 2, Sebeka, Minn.
HOWE, Frank L., Jr., P.O. Box 132, Norwalk, Conn.
HOXIE, Benjamin W., 3 Brookdale Rd., Montgomery County, Washington 16, D. C.
HUBBELL, Clinton C., 124 Perry Ave., Norwalk, Conn.
HUBBS, George L., Park View Engineering Service, 1519 Lewis St., Charleston 1, W. Va.
HUBER, L. Albertson, 297 E. Commerce St., Bridgeton, N. J.
HUDNALL, James S., Peoples Natl. Bank Bldg., Box 988, Tyler, Tex.
HUEY, R. B., 408 S. Spring St., Suite 400, Los Angeles 13, Calif.
HUEY, S. E., Heninger Bldg., Monroe, La.
HUFFAKER, Carl L., 7334 Forest Rd., Kent Village, Hyattsville, Md.
HUGHES, Francis, Instruments Ltd., 240 Sparks St., Ottawa, Canada
HUGHES, Joe W., c/o G. W. Herzog, Shell Oil Co., P.O. Box 2099, Houston 1, Tex.
HUGHES, Robert H., 752 Mineral Spring Rd., Youngstown 7, Ohio
HUGHES, Russell F., 495 Summer Ave., Boston 10, Mass.
HUGHES, Thomas A., USGS, Box 133, Rolla, Mo.
HULME, J. C., P.O. Box 1482, Athens, Ga.
HUMAN, Clarkson B., USGS, 1109 N. Highland St., Arlington, Va.
HUMPHREY, Clarence B., 2518 Ortington Ave., Evanston, Ill.
HUMPHREYS, Wilfred, Canadian Pacific Railway, Winnipeg, Canada
HUMRICH, Glenn E., 1061 Los Molinos Way, Sacramento, Calif.
HUNKAPILLER, Lt. Col. B. B., 1st Computations Technical Sqdrn., APO 845, c/o Postmaster, New York, N. Y.
HUNT, James C., 2705 Chesterfield Ave., Baltimore 13, Md.
HUTCHINS, John F., 114 Laclede Ave., Trenton 8, N. J.
HUTCHISON, Frank L., Route 3, Candler, N. C.
HUTCHISON, James P., 2901 78th Ave., District Heights, Md.
HUTCHISON, John Robert, 24 Royalist Rd., Cremorne, Sydney, N. S. W., Australia
HYDE, Obert R., P. O. Box 733, Juneau, Alaska

I

INGRAM, J. D., Shell Oil Co., Box 188, Morgan City, La.
INSKEEP, Clair A., 328 E. Sandusky Ave., Bellefontaine, Ohio
IRISH, J. Wilbur, 906 South St., Peekskill, N. Y.
IRISH, Prof. Sumner B., 203 Engineering Bldg., Washington Rd., Princeton, N. J.
IRVING, Ben B., 906 Military St., Roseburg, Oreg.
ISTO, Reynold E., 419 S. Corona St., Denver, Colo.

J

JACKSON, A. L., The Superior Oil Co., 400 Oil & Gas Bldg., Houston, Tex.
JACKSON, Charles Donald, 63 Sunshine Ave., Sausalito, Calif.
JACKSON, Emory A., 1002 Cedar St., Rolla, Mo.
JACKSON, Gorham E., 604 W. Main St., Washington, N. C.
JACKSON, Lynn O., 3068 Anzio Dr., Dallas, Tex.
JACOBS, Loring H., Jacobs Lane, Assinippi, Mass.
JAMES, Charles A., Gulf Oil Corp., P.O. Drawer 2100, Houston, Tex.
JAMES, M. H., Jr., 308 S. Liberty St., Canton, Miss.
JAMES, M. H., Sr., Sumner, Miss.
JAMIESON, David F., American Automobile Assoc., 17th & Pennsylvania Ave., N.W., Washington, D. C.
JANDACEK, George W., Chicago Guarantee Survey Co., 8620 S. Loomis St., Chicago 20, Ill.
JAPHET, George T., 1701 Walker St., Houston, Tex.
JEFFERS, Karl B., Commander, USC&GS, Washington 25, D. C.
JEFFS, Donald R., 2124 Bell St., Sacramento 15, Calif.
JENKS, Dr. George F., Dept. Geography, Univ. of Kansas, 419 Lindley Hall, Lawrence, Kans.
JENNINGS, Dean J., U. S. Bureau of Reclamation, P.O. Box 165, Palmer, Alaska
JENNS, P. A., 827 Dewey St., Kinston, N. C.
JENSEN, George K., 2210 Pyramid Way, Sacramento 15, Calif.
JEPPESEN, E. B., Jeppesen & Co., Stapleton Airfield, Denver 7, Colo.
JERO, Leslie M., P.O. Box 306, Wisconsin Rapids, Wis.
JEWELL, Loyd V., 18457 Magnolia Dr., Detroit 19, Mich.
JOHANNEMANN, Edward, 136 Woodside Ave., Freeport, N. Y.
JOHNSON, A. Clarence, 108 W. 2nd St., Rm. 725, Los Angeles 12, Calif.
JOHNSON, Benjamin O., State Office Bldg., Salem, Oreg.
JOHNSON, Erick A., 10 View South Ave., Jamaica Plain 30, Boston, Mass.
JOHNSON, Henry J., 5717 Kirby Dr., Houston, Tex.
JOHNSON, James E., 7713 E. Phlox St., Downey, Calif.
JOHNSON, Comdr. L. C., 6284 21st Ave., N.E., Seattle, Wash.
JOHNSON, Lewis L., Box 401, Rolla, Mo.
JOHNSON, Lewis S., 69-B Pearl St., San Francisco, Calif.
JOHNSON, Malcolm G., USGS, Box 133, Rolla, Mo.
JOHNSON, Murvin G., County Engineer, Barron, Wis.
JOHNSON, Peter H., USGS, Denver Federal Center, Denver, Colo.
JOHNSON, Ralph S., McNair Investment Co., Laurinburg, N. C.
JOHNSON, Stephen M., 8403 Garland Ave., Takoma Park 12, Md.
JOHNSON, William E., Air War College, Maxwell Air Force Base, Ala.
JOHNSTON, Henry M., Jr., USGS, Box 133, Rolla, Mo.
JOHNSTON, Odis D., Inter-American Geod. Survey, c/o U. S. Embassy, Lima, Peru
JOHNSTON, Thomas H., Jr., Fairfax Surveys, P.O. Box 293, Fairfax, Va.

JOLLY, John J., 208 Olive St., Rolla, Mo.
JONES, Bennett G., USC&GS, Washington 25, D. C.
JONES, C. V., 217 Wedge-Jones Bldg., Albert Lea, Minn.
JONES, Charles R., P.O. Box 369, Livingston, Tex.
JONES, Don A., Lt. Comdr., USC&GS, Washington 25, D. C.
JONES, Edgar, 2936 Polk St., San Francisco 9, Calif.
JONES, Edmund L., Commander, USC&GS, Washington 25, D. C.
JONES, Frank O., 101 S. Main St., Fairmont, Minn.
JONES, George K., 102 Woodworth St., Sayre, Pa.
JONES, Morris R., 21 Great Oaks St., Rolla, Mo.
JORDAN, John, 3610 San Ysidro Way, Sacramento 21, Calif.
JORDAN, Russell A., Jr., 2914 Wroxton Rd., Houston 5, Tex.
JORGENSEN, George C., P.O. Box 131, Manasquan, N. J.
JOSEPH, Marvin M., 472 N. Liberty St., Elgin, Ill.
JUDSON, Dr. Lewis V., National Bureau of Standards, Washington, D. C.
JUNEK, Filip F., 4209 54th Pl., Bladensburg, Md.
JUNGERS, Maj. Alfred F., 250 Rodgers Forge Rd., Apt. C, Baltimore 12, Md.
JURAS, George B., 6567 Sepulveda Blvd., Van Nuys, Calif.

K

KABLESH, Harry, USGS, Box 133, Rolla, Mo.
KACHORSKY, Michael S., P.O. Box 766, Manville, N. J.
KAEFFER, Chas. D., 349 Cedar Hill Ave., Wyckoff, N. J.
KAJDAN, Henry A., 528 Wellington Rd., Jackson, Miss.
KALBFLEISCH, Albert C., USGS, Washington 25, D. C.
KALLBRIER, Joseph E., USGS, Box 133, Rolla, Mo.
KAMP, Walter, Box 241, Carmel, N. Y.
KARGL, Gilard, 9333 Broadway, San Antonio 9, Tex.
KARO, H. Arnold, Commander, USC&GS, Washington 25, D. C.
KARR, W. S., 606 E. Shiawasse St., Lansing, Mich.
KASTENDIECK, George H., County Surveyor & Engineer, Springfield, Mo.
KATIBAH, George P., USGS, P.O. Box 346, Sacramento 2, Calif.
KAUFFMAN, Virgil, 236 E. Courtland St., Philadelphia, Pa.
KAUFMANN, George A., USGS, P.O. Box 346, Sacramento 2, Calif.
KAUTZ, William A., USGS, Denver Federal Center, Denver, Colo.
KECK, William G., c/o Fred W. Reimers, P.O. Box 960, Hammond, La.
KEEGAN, Kenneth B., 4739 Homer Ave., S.E., Washington 20, D. C.
KEERL, Win I., 691 Coast Blvd. South, Laguna Beach, Calif.
KELLER, B. R., Tennessee Gas Transmission, Commerce Bldg., Houston, Tex.
KELLER, James J., 201 S. Wright St., Champaign, Ill.
KELLER, William G., 20 Deacon Rd., Summit, N. J.
KELLEY, Robert W., Jr., 16 Bayville Dr., Baytown, Tex.
KELLEY, Tom, 111 W. Cayuga St., Tampa 3, Fla.
KELLY, George R., 6435 Fairfax Rd., Apt. 22, Chevy Chase, Md.
KELLY, Joseph G., 2045 Bleigh St., Philadelphia 15, Pa.
KELLY, William D., Summer St., Yarmouthport, Mass.
KELSEY, Ralph, 686 E. 120 St., Cleveland, Ohio
KELSH, Harry T., 1815 17th St., N.W., Washington 9, D. C.
KENDALL, Arthur W., Engineer Intelligence Div., Office Chief of Engineers, Washington 25, D. C.
KENNEDY, Daniel, USGS, Box 133, Rolla, Mo.
KENNEDY, Thomas J., Jr., 116 W. Nelson Ave., Alexandria, Va.
KENNEDY, William V., USGS, Box 133, Rolla, Mo.
KENT, Elmer J., Box 844, Placerville, Calif.
KERN, Kenneth C., 5511 Smallwood Dr., Greenacres, Washington 16, D. C.
KERR, John J., 6763 Thomas Blvd., Pittsburgh 8, Pa.
KERR, Victor H., 28 N. St. Clair St., Painesville, Ohio
KEUFFEL, Carl W., Keuffel & Esser Co., Adams and Third Sts., Hoboken, N. J.
KEY, John C., Prof., The Citadel, Charleston, S. C.
KIBBE, Morton H., Union Oil Co., 617 W. 7th St., Los Angeles 17, Calif.
KIFF, Glenn P., P.O. Box 1619, Tulsa, Okla.
KILMARTIN, Jerome O., USGS, Washington 25, D. C.
KIME, Bazil C., 532 Pine Acres Blvd., Brightwaters, N. Y.
KIMMICK, E. J., 19 Green Acres Dr., Rolla, Mo.
KINCH, Mack, Box 205, Urbana, Ill.
KING, Clifton E., P.O. Drawer 2643, 1701 Walker, Houston 1, Tex.
KING, George M., 223 Irving Ave., Bridgeton, N. J.
KING, J. A. Shirley, 44 George St., Brantford, Ont., Canada
KING, Paul, P.O. Box 142, Salem Station, Winston-Salem, N. C.
KING, W. Matson, Box 54, Millwood, W. Va.
KINGMAN, Mrs. Margaret Mace, R.F.D. #1, Vienna, Va.
KINGSBURY, Earl T., Jackson, Pa.
KINGSLAND, Lawrence Myrick, Transcontinental Gas Pipe Line Corp., M. & M. Bldg., Houston 2, Tex.
KINGSLEY, D. T., 415 First National Tower, Akron 8, Ohio
KINNEY, Richard A., Apt. Z1E, South Apts., Univ. of Maine, Orono, Maine
KIRBY, Edwin J., 1711 E. 32nd St., Baltimore 18, Md.
KIRCHER, A. M., 302½ N. Front St., Mankato, Minn.
KIRCHNER, Charles L., P.O. Box 712, Curundu, Canal Zone
KIRCHOFF, L. J., 215 S. Washington, Eagle Grove, Iowa
KIRKMAN, B. E., 425 Lyon St., Charlotte 5, N. C.
KIRLYS, Pranas, 984 Wheelock Rd., Cleveland 3, Ohio
KISSAM, Prof. Philip, 15 Newlin Rd., Princeton, N. J.
KLAIN, Julius, 931 Schumacher Dr., Los Angeles 48, Calif.
KLEIN, Irwin, 4 Military Court, Rolla, Mo.
KLEIN, William, Apt. 1, 1122-CEC Knight St., Lewis Heights, Fort Belvoir, Va.
KLINE, Dr. Hibberd V. B., Jr., Syracuse Univ., Syracuse, N. Y.
KNEZOVICH, Maj. Francis M., Apt. 211A, 724 S. St. Asaph St., Alexandria, Va.
KNICKERBOCKER, Howard, Salisbury, Conn.
KNIGHT, Charles E., 7385 Poe Ave., Detroit 6, Mich.
KNIGHT, Edmund C., P.O. Box 931, Savannah, Ga.
KNIPHORST, Boekhandel, Hoogstraat 49, Wageningen, Holland
KNIPPEL, Paul R., Route 57, Troy, N. Y.
KNOTT, Robert J., c/o The Atlantic Refining Co., Box 1116, Seminole, Tex.
KNOWLES, John S., U. S. Bur. Land Management, 1245 N. 29th St., Billings, Mont.
KNOX, Rear Adm. Robert W., USC&GS, Washington 25, D. C.
KOLTUN, Edward L., P.O. Box 346, Sacramento 2, Calif.
KONIKOWSKI, Edward G., 159 Wallington Ave., Wallington, N. J.

KOTSMITH, Joseph D., Foley, Minn.
KOWALCZYK, Chester E., 1504 Noyes Dr., Silver Spring, Md.
KOWALKE, E. F., P.O. Box 542, Minocqua, Wis.
KOZAK, Anton F., 4312 W. Cermak Rd., Chicago 23, Ill.
KRAHMER, Edward A., USGS, 1109 N. Highland St., Arlington, Va.
KRAMLICH, Richard F., 1208 Union St., Allentown, Pa.
KRAUSE, Robert H., 1926 E. 79th St., #2, Cleveland, Ohio
KRICHBAUM, F. D., Orrville, Ohio
KRIEG, Curtis O., Route 4, Box 76-G, Ocala, Fla.
KRONK, Morgan E., 1803 Boundary St., Aliquippa, Pa.
KROPET, Harry Jennings, 2339 Albans Rd., Houston 5, Tex.
KUHN, Aloys, Nagogami Rd., Rolla, Mo.
KULP, R. F., 10910 S. Lakewood Blvd., Downey, Calif.
KUPPER, Charles J., 15 Stelton Rd., New Market, N. J.
KURRLE, Alan F., 60 Manning Rd., East Malvern, Victoria, Australia
KUTIS, Edward, 3618 W. 139th St., Cleveland, Ohio
KUZMICKI, Felix D., Route 2, Box 335, Birmingham 9, Ala.
KUZMICKI, Roland T., 4705 8th Ave., Wylam, Ala.

L

LA BARRE, Leonard Luke, P.O. Box 95, Thompson, Pa.
LABBE, Carl A., USGS, Denver Federal Center, Denver, Colo.
LACY, George H., Gulf Oil Corp., P.O. Drawer 2100, Houston, Tex.
LADD, Edward J., P.O. Box 66, Ft. Payne, Ala.
LADD, Col. John G., 2819 45th St., N.W., Washington 7, D. C.
LAFARGUE, Irion, Commercial Bldg., Alexandria, La.
LAIDLY, William T., 19150 Ilene Ave., Detroit 21, Mich.
LAIRD, Max O., Rm. 2305, 32 Ave. of The Americas, New York 13, N. Y.
LAIRD, Russell M., M.S.M., Apt. 0-7, Rolla, Mo.
LAMB, A. L., 111 Morro St., Box 187, Shell Beach, Calif.
LAMBELET, Lawrence E., 1001 Lynwood Dr., Rolla, Mo.
LAMBERSON, Ray E., 5826 N.E. Wygant, Portland 13, Oreg.
LAMBERT, Bruce P., Natl. Mapping, Property Survey Br., Dept. of the Interior, Canberra, N.S.W., Australia
LAMBERT, Leonard E., 520 10th St. South, Virginia, Minn.
LAMBERT, Walter D., P.O. Box 687, Canaan, Conn.
LAMONT, R. E., 1st Lt., 7714 Engineer Intelligence Group, APO 403, c/o Postmaster, New York, N. Y.
LAMPE, T. Peter, Adel, Iowa
LAMPP, Edward R., 210 Todd Bldg., Ocala, Fla.
LAMPRECHT, Joseph, Manlius Rd., Fayetteville, N. Y.
LANDEN, David, 313 N. George Mason Dr., Arlington 3, Va.
LANDER, William P., Lander Engineering Co., 3721 Winchell Rd., Cleveland 22, Ohio
LANDERS, Walter, Calif. Div. Hwys, Public Works Bldg., Sacramento, Calif.
LANDIS, Melvin P., P.O. Box 145, 252 Laura St., Wichita, Kans.
LANE, Frank B., 8904 Ewing Dr., Bethesda, Md.
LANE, George S., 4644 W. 17th St., Los Angeles 19, Calif.
LANG, Howard J., P.O. Box 1352, Fresno, Calif.
LANGALL, Fred C., 912 N. 9th St., Klamath Falls, Oreg.
LANGHOFER, Joel H., USGS, Denver Federal Center, Denver, Colo.
LAPHAM, Paul B., Box 92, Marathon, Fla.
LARKINS, Malcolm G., Jr., USGS, P.O. Box 346, Sacramento 2, Calif.
LARNER, John William, 164 E. Seaman Ave., Freeport, N. Y.
LARRABEE, Bruce M., 256½ 2nd St., Lakewood, N. J.
LARSEN, H. R., c/o Servo-Mechanisms, Inc., P.O. Box 10037, Airport Station, Los Angeles 45, Calif.
LARSEN, James H., County Surveyor, Court House, Racine, Wis.
LARSON, Edward, 830 Main St., Cincinnati 2, Ohio
LARSON, Lawrence M., 657 Elmwood Ave., Webster Groves 19, Mo.
LARSON, Lester A., 1384 South, 14th East, Salt Lake City, Utah
LASKOWSKI, John, Commander, USC&GS, 418 Post Office Bldg., Norfolk 10, Va.
LATHROP, B. G., Forest Lake, Minn.
LATIMER, Philip A., Route 2, Box 3, Edgewater Post Office, Md.
LAURITZEN, Kay, Aalekistevej 44, Vanlose, Copenhagen, Denmark
LAVAN, Maj. Ray E., Okinawa Engineer District, APO 331, c/o Postmaster, San Francisco, Calif.
LAVERY, Frederick G., 1805 Cedar St., Rolla, Mo.
LAW, John A., 6208 28th St. N., Arlington, Va.
LAWSON, James M., USGS, Box 133, Rolla, Mo.
LEACH, Theodore L., 1020 Wall St., Port Huron, Mich.
LEACH, Walter W., County Surveyor, Grossbeck, Tex.
LEACHMAN, Jewel B., 42 Rolla Gardens, Rolla, Mo.
LEATHERWOOD, George M., 3458 Albee St., Eureka, Calif.
LECLAIR, Lionel G., 326 11th St., West Sacramento, Calif.
LEE, Douglas R., Route 3, Box 101, Picayune, Miss.
LEE, Robert O., 1801 N. Monroe St., Arlington 7, Va.
LEFKOWITZ, Hyman I., 3223 Grandeau Ave., Alladena, Calif.
LEGEAR, Mrs. Clara Egli, Map Division, Library of Congress, Washington 25, D. C.
LEHMAN, Louis, 375 W. State St., Trenton, N. J.
LEIFSON, Gunnar, Hydrographic Office, Navy Dept., Washington 25, D. C.
LEIGHTON, Kenneth W., 156 Maple St., New Haven 11, Conn.
LEMMER, Carl, County Surveyor, Court House, Great Falls, Mont.
LEMOINE, Jules C., Box 1264, Bay City, Tex.
LENAHAN, C. B., County Engineer, Court House, Vincennes, Ind.
LENT, Walter B., Lederle Lab., Amer. Cyanamid Co., Middletown Rd., Pearl River, N. Y.
LENTZ, Fred C., 2 Cronin Court, Rolla, Mo.
LEONARD, E. C., 305 Cameron Ave., Chapel Hill, N. C.
LEONARD, Robert H., USGS, Box 133, Rolla, Mo.
LETEY, Albert E., USGS, P.O. Box 346, Sacramento 2, Calif.
LETZ, Paul John, 626 N. Parkerson Ave., Crowley, La.
LEUE, Capt. Conrad F., District Bldg., Washington 4, D. C.
LEVAN, Howard A., Jr., 25 N. Front St., Harrisburg, Pa.
LEVASSEUR, A. J., 121 Union St., Sulphur, La.
LEVY, Sam Francis, 1725 Pacific Ave., San Leandro, Calif.
LEWANDORF, S. C., Cleveland Surveys, 900 Old Arcade, Cleveland, Ohio
LEWIS, Mrs. Dorothy Cornwell, 705 N. Daniel St., Arlington, Va.
LEWIS, E. Robert, 109 Park Ave., Plainfield, N. J.
LEWIS, Edward S., 109 Park Ave., Plainfield, N. J.
LEWIS, Prof. George R., 901 Wood St., Clarion, Pa.

LEWIS, John L., USGS, P.O. Box 346, Sacramento 2, Calif.
LEWIS, John M., Army Map Service, 6500 Brooks Lane, Washington 16, D. C.
LIENESCH, John P., 38 Neponset Ave., Foxboro, Mass.
LILLY, James H., 2347 C Ave., N.E., Cedar Rapids, Iowa
LINCOLN, William M., 1437 National Bank Bldg., Detroit 26, Mich.
LIND, Charles George, 171 Arlyn Dr. West, Massapequa, N. Y.
LINDENFELD, John A., Los Angeles Transit Lines, 717 E. 16th St., Los Angeles, Calif.
LINDER, Tom, Commissioner of Agriculture, State Capitol, Atlanta, Ga.
LINDSAY, Lt. Col. C. C., Rm. 808, Tramways Bldg., 159 Craig St. West, Montreal, P. Q., Canada
LINDSAY, Robert John, Rm. 808, Tramways Bldg., 159 Craig St. West, Montreal, P. Q., Canada
LINDSTROM, John M., 317 S. West Ave., Elmhurst, Ill.
LINEHAM, Urban J., Dept. of Geography, The Catholic Univ. of America, Washington 17, D. C.
LINN, Gladys G., USGS, P.O. Box 346, Sacramento 2, Calif.
LINT, Leigh B., Rm. 544, Appraisers Bldg., 630 Sansome St., San Francisco 11, Calif.
LINTON, Robert N., Linton & Hatch Co., 320 Ontario St., Toledo 2, Ohio
LINTZ, Clarence F., 1225 Perris St., San Bernardino, Calif.
LITTLE, Robert E., USGS, Box 133, Rolla, Mo.
LITTLEPAGE, Gordon B., Jr., USC&GS, Washington 25, D. C.
LIVINGSTON, Geo. M., The Texas Co., 1610 National Standard Bldg., Houston, Tex.
LOCATELLI, Delfo E., Estanislao S. Zeballos 2750, Rosario, Argentina
LOCKTON, Eugene, 20 Hillcrest Dr., San Rafael, Calif.
LOCRAFT, Bernard F., 1179 New Hampshire Ave., N.W., Washington 7, D. C.
LODGE, Friend H., Chamber of Commerce, 3rd & Liberty St., Louisville 2, Ky.
LOEFFLER, Albert L., 3680 Merrick Rd., Seaford, N. Y.
LOEFFLER, M. M. J., 13674 Thornton St., Detroit 27, Mich.
LOFGREN, Paul F., 1734 P St., N.W., Washington 6, D. C.
LOGAN, R. W., Grant Photo Products, 18915 Detroit Ave., Cleveland 7, Ohio
LOLLICH, P. M., Pennsylvania Game Comm., Harrisburg, Pa.
LONG, J. T., USGS, P.O. Box 346, Sacramento 2, Calif.
LOOMIS, Frank S., Maps & Surveys Div., T.V.A., Chattanooga, Tenn.
LORENZ, Maj. Gilbert G., 1559 N. Jefferson St., Arlington, Va.
LOSAK, George, 6 Court "8," Lake Village, Wilmington, N. C.
LOUD, Edward I., Jr., USGS, 1109 N. Highland St., Arlington, Va.
LOVELL, Carl V., North Penn Gas Co., 76–80 Mill St., Port Allegany, Pa.
LOVESEE, George W., P.O. Box 452, Fernandina, Fla.
LOWREY, Perry O., Aptdo. 246, Socony Vacuum Oil Co., Caracas, Venezuela
LOWRY, Robert W., Capitol Engrg. Co., Church St., Dillsburg, Pa.
LOZANO, M., 601 Stewart Bldg., Houston 2, Tex.
LUCAS, James H., Prof., Georgia Tech, Atlanta, Ga.
LUCKUS, Joseph W., USGS, 1109 N. Highland St., Arlington, Va.
LUERS, Frank, 723 W. Park, Box 193, Riverton, Wyo.
LUNDBERG, Edward A., 2640 Louisiana St., Sacramento 15, Calif.
LUNDGREN, Arnold, 1234 4th Ave., Rockford, Ill.
LUNDSTROM, Willard J., 3401 Sheridan St. N., Minneapolis 11, Minn.
LUPO, John M., Jr., Direct Reproduction Corp., 811–813 Union St., Brooklyn, N. Y.
LUQUIRE, Joseph W., Jr., 255 St. Francis St., Mobile, Ala.
LUSHENE, Joseph P., Commander, USC&GS, Washington 25, D. C.
LUTCHEN–LEHN, John E., Socony Vacuum Oil Co., Apartado No. 246, Caracas, Venezuela
LYCETT, John H., USGS, 1109 N. Highland St., Arlington, Va.
LYDDAN, Robert H., USGS, Washington 25, D. C.
LYMAN, Earl W., 597 Church St., Bloomington, Calif.
LYON, Pierson C., USGS, Box 133, Rolla, Mo.
LYON, R. N., Jr., Hampton, Ark.
LYONS, William A., 1001 20th St., Newport News, Va.

M

MacCARTHY, R. E., Rm. 18, Clark Bldg., Main St., Natick, Mass.
MacFADDEN, Clifford H., Prof., Univ. of California, Los Angeles, Calif.
MacILQUHAM, W. L., The Canadian Institute of Surveying, 41 Grove Ave., Ottawa, Ont., Canada
MacKAY, Harold L., USGS, P.O. Box 346, Sacramento 2, Calif.
MACK, Joseph H., County Surveyor-Road Commissioner, 306 Civic Center, San Diego 1, Calif.
MADSON, Carlisle, 3035 Oregon Ave., St. Louis Park 16, Minn.
MAGER, Charles, Jr., USGS, 1109 N. Highland St., Arlington, Va.
MAGGARD, Allen, English Ave., Austin, Ind.
MAIDLOW, Delbert K., 6606 Rolla Ave., Houston 7, Tex.
MAINEY, L. Hugh, R.F.D. #8, Box 84, San Jose, Jacksonville 7, Fla.
MAKAR Dr. O., 1411 Michigan Ave., Alamogordo, N. Mex.
MAKI, Kalervo N., 3079 S. Buchanan St., Arlington, Va.
MALE, Charles T., Jr., R.D. #1, Schenectady, N. Y.
MALNATE, William F., Commander, USC&GS, Washington 25, D. C.
MALONE, Francis J., Box 166, Hypoluxo, Fla.
MALOT, John Woodrow, Box 208, Hustontown, Pa.
MALOY, Francis J., 7101 New Hampshire Ave., Takoma Park, Md.
MALTBY, Calvin S., USGS, Washington 25, D. C.
MANESS, Lucian, 29th Engr. Base Topo. Bn., APO 928, c/o Postmaster, San Francisco, Calif.
MANGAN, Mrs. Grace A., 2730 10th St., N.E., Washington, D. C.
MANN, Franklin M., 3008 Second St. N., Arlington, Va.
MANN, Robert E., P.O. Box 182, Clifton, Ariz.
MANNAR, Braxton W., 4998 Saratoga Ave., Washington 16, D. C.
MANNERFELT, Dr. Carl M., Map Editor Esselte AB, Vasagatan 16, Stockholm 1, Sweden
MANOR, Charles R., Route 1, Box 391-E, Alexandria, Va.
MANSFIELD, E. G., County Surveyor, P.O. Box 593, Redmond, Oreg.
MANSFIELD, Lloyd B., USGS, P.O. Box 346, Sacramento 2, Calif.
MARGOLIN, Josef, 31 Lilienblum St., Tel Aviv, Israel
MARKLEY, Harry D., 705 Sixth St., N.W., Canton 3, Ohio
MARKS, George W., City and County Engineer, Torrington, Wyo.
MARKUSSEN, Kenwood M., 810 Orchard St., Rolla, Mo.
MARMER, H. A., USC&GS, Washington 25, D. C.
MARNUL, John, 2117 Bissell St., Chicago 14, Ill.
MARSDEN, Lloyd E., USGS, Box 133, Rolla, Mo.

MARSH, Daniel, 5859 Canyon Cove, Los Angeles 28, Calif.
MARSHALL, Lorraine F., U. S. Bureau of Reclamation, Elverta, Calif.
MARSHALL, Oscar J., 10 Hillhurst Blvd., Toronto, Ont., Canada
MARTENS, Adolph G., Moran, Proctor, Freeman & Mueser, Graybar Bldg., New York, N. Y.
MARTIN, Francis I., Apartado 1193, Caracas, Venezuela
MARTINI, Arturo B., Mountain Lake Park, Md.
MARX, Donald E., Bonneville Power Adm., P.O. Box 3537, Portland, Oreg.
MASON, Bertell, Jr., Box 292, Oak Grove, Oreg.
MASON, Hodge E., Rm. 898, Humble Bldg., Houston, Tex.
MASSA, William S., Maps & Surveys Div., T.V.A., 706 Pound Bldg., Chattanooga 1, Tenn.
MATERAZZI, Albert R., 461 Southampton Dr., Silver Spring, Md.
MATHIAS, Julius A., USGS, 1109 N. Highland St., Arlington, Va.
MATHIESEN, John T., Johnson Printing, Inc., 2219 Galloway St., Eau Claire, Wis.
MATHISSON, John C., Lt. Comdr., USC&GS, Washington 25, D. C.
MATTESON, Ray C., 36 Mapledale St., Anthony, R. I.
MATTHEWS, Col. Albert G., 1342 N. Terrace, Tallahassee, Fla.
MATTINGLY, James A., USGS, 1109 N. Highland St., Arlington, Va.
MAULAWIN, Sergio M., Lt. Comdr., Philippine Coast & Geodetic Survey, Manila, Philippines
MAWHINNEY, Richard A., 41 Water St., Machias, Maine
MAXSON, Robert O., 3 Brookhaven Dr., McLean, Va.
MAY, James Horace, P.O. Box 83, Rio Grande City, Tex.
MAY, Marvin C., Prof., Dept. Civil Engineering, Univ. of New Mexico, Albuquerque, N. Mex.
MAYNADIER, William M., 1932 Joppa Rd., Towson 4, Md.
MAYNARD, Clarence Francis, USC&GS, 641 Washington St., New York 14, N. Y.
MAYNE, J. H., 400 Glen Ave., Council Bluffs, Iowa
MAYSE, M. M., County Engr. & Surveyor, Court House, Mankato, Kans.
McADAMS, J. Mark, Williamson Ave., Elon College, N. C.
McADOO, Malcolm R., Jr., 2928 S. Buchanan St., Arlington 6, Va.
McALINDEN, John M., 1415 East-West Hwy., West Hyattsville, Md.
McCALL, John S., Box 352, Washington St., Parkers Landing, Pa.
McCAMMON, Robert L., 9 West St., Rutland, Vt.
McCANN, John J., USGS, Box 133, Rolla, Mo.
McCARTHY, E. R., Commander, USC&GS, Washington 25, D. C.
McCARTY, J. E., 125 Eldora Dr., Mountain View, Calif.
McCARTY, Malcolm D., Magnolia Petroleum Co., Box 900, Dallas, Tex.
McCAW, C. W., 1017 W. 14th, Rolla, Mo.
McCLANE, James E., 5600 8th St. South, Arlington 4, Va.
McCLELLAN, Bert. G., 1218 E. Victoria St., South Bend, Ind.
McCLELLAN, M. C., 43 Rolla Gardens, Rolla, Mo.
McCLENNEN, Frederick H., Lakeside Dr., Victory Lakes, Williamstown, N. J.
McCONNELL, Hunter J., USGS, P.O. Box 346, Sacramento 2, Calif.
McCORMICK, Thomas E., The Boston City Planning Board, 43 City Hall, Boston 15, Mass.
McCOY, William H., Route #4, Box 641, Modesto, Calif.
McCRONE, John Roy, Jr., Towns-Worth Bldg., Annapolis, Md.
McCURDY, P. G., U. S. Hydrographic Office, Suitland, Md.
McCURDY, William R., 51 Evergreen Ave., Hartford, Conn.
McCUTCHEN, A. C., USGS, Box 133, Rolla, Mo.
McDANIEL, James D., USGS, Box 133, Rolla, Mo.
McDERMITH, Harry, 2737 Julian St., Denver 11, Colo.
McDERMOTT, L. T., 2101 Woodland Ave., N. W., Canton 9, Ohio
McDONALD, Emmet J., 265 S. Main St., Akron 8, Ohio
McDONALD, Frank H., 972 McCarter Hwy., Newark, N. J.
McDONALD, James E., 1402 Broadway N.E., Knoxville, Tenn.
McFARLAN, Harold J., 151 Barton Dr., Ann Arbor, Mich.
McGANN, Leonard A., USC&GS, Washington 25, D. C.
McGIRK, Lon S., Jr., Dept. of Geology, Stanford Univ., Calif.
McGIVERN, Robert F., USGS, Denver Federal Center, Denver, Colo.
McGREGOR, John W., 1101 Lynwood Dr., Rolla, Mo.
McGUIRE, C. T., Raddue Bldg., Grass Valley, Calif.
McGUIRE, James J., 142 Walnut St., Lynbrook, N. Y.
McHUGH, James J. P., USGS, Box 133, Rolla, Mo.
McINTOSH, Elva Lea, Box 92, Marathon, Fla.
McINTOSH, W. L., Geophysical Service, Inc., 6000 Lemmon Ave., Dallas, Tex.
McINTYRE, Kenneth E., Professional Bldg., Walpole, Mass.
McIVER, H. M., 1424 Wood St., Texarkana, Tex.-Ark.
McKIBBEN, J. C., Div. of Waterways, 201 W. Monroe St., Springfield, Ill.
McKIDDY, Paul, Fort Stevens, Hammond, Oreg.
McKNIGHT, Chas. P., 7115 Staffordshire St., Houston 25, Tex.
McLAGAN, Paul R., 233 Dakota Ave., West St. Paul 7, Minn.
McLAUGHLIN, J. W., 400 N.E. 3rd Ave., Fort Lauderdale, Fla.
McLENDON, Gerald, 1403 Calden St., Gretna, La.
McLERRAN, James Herschel, 411 W. William, West Lafayette, Ind.
McMAHON, John J., 11621 E. Jefferson, Detroit, Mich.
McMAHON, Vincent P., 11621 E. Jefferson, Detroit, Mich.
McMANUS, Vincent D., 108 Washington St., Williamsburg, Va.
McMILLAN, Merrill G., 602 Marion St., Aiken, S. C.
McMILLEN, H. J., 4311 15th St. North, Arlington, Va.
McMULLEN, Wm. H., 510 Dunbar St., Refugio, Tex.
McNAIR, Arthur J., Prof., Dept. Surveying and Mapping, Cornell Univ., Ithaca, N. Y.
McNALLEY, Lee, 401 State Office Bldg., St. Paul 1, Minn.
McNEAL, John, 3rd, 312 High St., Easton, Pa.
McNEILL, Thomas B., 35 Laurel Ave., Takoma Park, Md.
McQUAID, Dan J., 1244 Broadway, Denver 3, Colo.
McSTEEN, Joseph E., 2332 Scholl Rd., University Hts., Cleveland 18, Ohio
McSWAIN, Horace L., R.F.D. 4, Macon, Ga.
MECHA, Richard B., 914A N. 5th St., Manitowoc, Wis.
MEDINA, Guillermo, U. S. Hydrographic Office, Suitland, Md.
MEDINA, Manuel, Dir. "B," Oficina de Geografia, 3a de Mier y Pesado 236, Colonia del Val., Mexico, D. F., Mexico
MEEKS, William R., Survey Service Co., 4109 E. Eleventh St., Tulsa 12, Okla.
MEIBEYER, E. H., Lufkin Rule Co., 1730 Hess Ave., Saginaw, Mich.

MEIER, William G., North Country Rd., Wading River, N. Y.
MEISNER, James F., County Engineer, Court House, Marion, Kans.
MEIXNER, Howard F., R.D. #2, W. Grange Ave. & Ridge Pike, Collegeville, Pa.
MEJIA J., Eduardo, Edificio de Comercio 612, Medellin, Colombia
MELDEN, Charles L., Talbot Bldg., Edinburg, Tex.
MERRIAM, Carroll F., Pennsylvania Water & Power Co., Baltimore 3, Md.
MERRIAM, Leo James, 1405 E. Sixth St., Cleveland 14, Ohio
MESSENGER, A. R., 221 13th St., N.W., Cedar Rapids, Iowa
MESSTER, E. O., Zeiss-Aerotopograph, G.M.B.H., Prinzenstrasse No. 18, Munich 19, U. S. Zone, Germany
MEYER, William H., 32 Hillcrest Ave., P.O. Box 411, Manhasset, L. I., N. Y.
MIDDLETON, Charles B., 207 E. Aster Rd., Wildwood Crest, N. J.
MIDDLETON, Ronald S., 44 George St., Brantford, Ont., Canada
MIKELS, John V., Corp. Venezolana de Fomento, Dept. Electric., Reg. Oriente, Caiguire, Estado Sucre, Venezuela
MILARDOVICH, Joseph A., USGS, P.O. Box 346, Sacramento 2, Calif.
MILCIADES, Varon R., Palacio Municipal #202, Medellin, Colombia
MILES, Phil M., 229 Barrow Rd., Lexington 28, Ky.
MILES, William P., 1133 Newby St., Chattanooga, Tenn.
MILLER, Arthur C., 617–19 Barnett-Madden Bldg., P.O. Box 1429, Jackson, Miss.
MILLER, Arthur S., Paynesville, Minn.
MILLER, Bill, Stamler & Miller, 403 Milam Bldg., Houston, Tex.
MILLER, Charles C., 1200 S. Stoneman Ave., Alhambra, Calif.
MILLER, Charles I., USGS, 1109 N. Highland St., Arlington, Va.
MILLER, Charles L., Michael Baker, Jr., Inc., P.O. Box 1429, Jackson 5, Miss.
MILLER, Chester E., USGS, Box 133, Rolla, Mo.
MILLER, George E., Jr., P.O. Box 305, Geneva, Ala.
MILLER, Glen H., 531 Carver Bldg., Fort Dodge, Iowa
MILLER, Harold P., R. 1, Box 2445, Portland 66, Oreg.
MILLER, Harry C., 1935 Hillside Rd., Seven Hills, Cleveland 9, Ohio
MILLER, Harry J., 3712 N. 17th St., Arlington, Va.
MILLER, Ira C., P.O. Box 297, Libby, Mont.
MILLER, Dr. John V., P.O. Box 198, Dillsburg, Pa.
MILLER, O. M., American Geographical Society, Broadway at 156th St., New York, N. Y.
MILLER, Olin R., 560 28th St., Longview, Wash.
MILLER, Rex F., P.O. Box 316, Hickory, N. C.
MILLER, Samuel W., Jr., Corps of Engineers, Fort Norfolk, Va.
MILLER, W. H., Surveys & Mapping Branch, Dept. Mines & Tech. Surveys, Ottawa, Ont., Canada
MILLS, David L., 5507 Redford Rd., Washington 16, D. C.
MILLS, Fulton, 1605–07 Tower Bldg., Jackson, Miss.
MILLS, Neal, 738 Maltman Ave., Los Angeles 26, Calif.
MILLS, R. Ewell, The Texas Co., P.O. Box 2332, Houston 1, Tex.
MILNE, Dexter E., 307 Holmes Lane, Oregon City, Oreg.
MILSTED, Harry S., USGS, Box 133, Rolla, Mo.
MINCKLER, Howard G., Springer Ave., Bridgeport, N. J.
MINER, Emerald O., USGS, 1109 N. Highland St., Arlington, Va.
MIRGAIN, Frank C., Prof., The Cooper Union School of Engrg., Cooper Square, New York 3, N. Y.
MISCOSKI, Vincent T., 6367 Oxon Hill Rd., S.E., Washington 20, D. C.
MITCHELL, James S., USGS, P.O. Box 346, Sacramento 2, Calif.
MITCHELL, Mrs. Margaret H., 6841 N. Washington B. d., Falls Church, Va.
MITCHELL, Sam E., 203 W. 9th St., Casseville, Mo.
MITCHELL, Thomas F., 100 S. Feltus St., South Amboy, N. J.
MOBLEY, Robert L., 336 W. Mountain Ave., Las Cruces, N. Mex.
MOCK, Granville A., USGS, Washington 25, D. C.
MOFFITT, Francis H., Prof., Div. of Civil Engineering, Univ. of California, Berkeley 4, Calif.
MOITORET, Comdr. Victor A., 4762 East Ave., Suitland, Washington 19, D. C.
MONBECK, R. R., USGS, P.O. Box 346, Sacramento 2, Calif.
MONCRIEF, L. H., 605 W. Storey St., Midland, Tex.
MONDAY, Frank E., 4324 Halley Terrace, S.E., Washington 20, D. C.
MONK, Wayne S., USGS, 1109 N. Highland St., Arlington, Va.
MONROE, Clarence A., 23 Madison Pl., Roslyn Heights, N. Y.
MONSEN, Myron T., 22 E. Illinois St., Chicago 11, Ill.
MONTAGNE, Louis D., 900 76th St., North Bergen, N. J.
MONTGOMERY, Sam W., USGS, 1109 N. Highland St., Arlington, Va.
MOORE, Lionel C., USGS, Washington 25, D. C.
MOORE, Raymond L., 304 N. Moore Rd., Chattanooga, Tenn.
MOORE, Richard S., Army Map Service, 6500 Brooks Lane, Washington 16, D. C.
MOORE, Roland H., USGS, Denver Federal Center, Denver, Colo.
MOORE, W. P., c/o Phillips Petroleum Co., Bartlesville, Okla.
MOORHEAD, J. R., Jr., Moorhead Engineering Co., P.O. Box 495, Ocala, Fla.
MOORHEAD, T. O., Box 326, Tavares, Fla.
MORAN, Edward A., Jr., St. Andrew-on-Hudson, Poughkeepsie, N. Y.
MORAVETZ, Lt. Col. Robert L., 3813 N. 4th St., Arlington, Va.
MORGAN, Carl W., 1708 Westover Rd., Austin, Tex.
MORGAN, James C., 177 Keewatin Ave., Toronto 12, Ont., Canada
MORING, Leland D., 616 Woodlawn Ave., Rockford, Ill.
MORRIS, Prof. Fred C., P.O. Box 243, Blacksburg, Va.
MORRIS, Paul, Maps & Surveys Branch, T.V.A., 710 Pound Bldg., Chattanooga, Tenn.
MORRISON, Grover C., 912 Trinity St., Austin, Tex.
MORRISON, Howard A., Jr., 165 Newbury St., Boston, Mass.
MORRISON, Lloyd J., 3274 Grant Ave., Ogden, Utah
MORSE, E. D., 3329 Drexel Dr., Houston 6, Tex.
MORSE, F. S., c/o Warren & Van Praag, Engineers, 253 S. Park St., Decatur, Ill.
MORTENSON, Charles N., USGS, P.O. Box 346, Sacramento 2, Calif.
MOSELOWITZ, Herman G., 7 Spring St., New Brunswick, N. J.
MOSER, William H., 1503 Acheson St., San Diego 11, Calif.
MOSES, Sidney, 464 Farmington Ave., Hartford 5, Conn.
MOSS, William H., 1413 Eye St., N.W., Washington, D. C.
MOULTREP, Prof. Kendall, Waites Corner Rd., West Kingston, R. I.
MOZZOCHI, John J., 343 New London Turnpike, Glastonbury, Conn.
MUIR, Logan N., 1211 Sixteenth St., Sacramento 14, Calif.
MULLAN, Robert H., 815 Coal St., Wilkinsburg, Pa.

MUNDHENK, George, 7623 S. Denker Ave., Los Angeles 47, Calif.
MUNSON, Archie T., 324 Little Falls St., Falls Church, Va.
MUNTHE-KAAS, Col. O., Military Attaché, Norwegian Embassy, 3516 Massachusetts Ave., N.W., Washington 7, D. C.
MURAKAMI, Shozo T., 1340 Maryland St., Los Angeles 17, Calif.
MURPHY, Charles F., USGS, 1109 N. Highland St., Arlington, Va.
MURPHY, Thorist F., USGS, P.O. Box 346, Sacramento 2, Calif.
MURPHY, W. J., County Engineer, Box 91, Kenmare, N. Dak.
MURPHY, Lt. (jg) Wilburn D., Staff Box 7, CINCNELM, Fleet Post Office, New York, N. Y.
MURRAY, Lawrence W., 411 2nd Ave., N.E., Belmond, Iowa
MUTERSBAUGH, Walter Grant, Shell Oil Co., Box 2099, Houston 1, Tex.

N

NAHAS, G. Frederick, 7618 15th Ave., Takoma Park, Md., (D. C. 12)
NALLS, James W., 1411 Pennsylvania Ave., N.W., Washington 4, D. C.
NARINS, Charles S., 342 Madison Ave., New York, N. Y.
NATELLA, Fred, Commander, USC&GS, Washington 25, D. C.
NEAL, John M., USC&GS, Washington 25, D. C.
NEARY, Floyd B., USGS, 1109 N. Highland St., Arlington, Va.
NEDBERGE, Carl J., County Surveyor, Route 1, Detroit Lakes, Minn.
NEILAN, Francis G., 123 Vannear Ave., Somerset, Pa.
NELSON, Edward E., Commonwealth Edison Co., Rm. 825, 72 W. Adams St., Chicago, Ill.
NELSON, Edward N., 207 Post Ave., Westbury, Nassau County, N. Y.
NELSON, Elbert L., USGS, P.O. Box 346, Sacramento 2, Calif.
NELSON, Comdr. George A., 705 Federal Office Bldg., Seattle 4, Wash.
NELSON, Ivan E., 1019 Morrell St., Rolla, Mo.
NELSON, Oscar H., USGS, Washington 25, D. C.
NELSON, Lt. R. G., c/o Resident Engineer's Office, Whittier, Alaska
NELSON, Raymond M., 118 Pine Dr., Annandale, Va.
NELSON, Toivo J., USGS, P.O. Box 346, Sacramento 2, Calif.
NELSON, W. T., Survey Div., Los Angeles District, 13456 Reedley St., Van Nuys, Calif.
NEMMER, John, 409 Overlook Blvd., Pittsburgh 10, Pa.
NEWELL, W. D., 323 W. Tennessee St., Floydada, Tex.
NEWLAND, D. E., Wytheville, Va.
NEWLIN, Delmas B., USC&GS, Washington 25, D. C.
NEWLIN, Philip B., 2117 E. 37th St., Tucson, Ariz.
NEWMAN, J. R., Memphis District C. E., Box 97, Memphis, Tenn.
NEWTON, Thomas R., Civil Engineering Instructor, Texas A & M College, College Station, Tex.
NEWVILLE, J. R., 1127 W. Washington Blvd., Los Angeles 15, Calif.
NICHOLS, Rear Adm. C. L., International Hydrographic Bureau, Quai de Plaisance, Monte Carlo, Monaco
NIDHES, Lt. Gen. Phya Salwidhan, 70 Lang Suan Rd., Ploenchitr, Bangkok, Siam
NIERINTZ, William F., City Engineer, City Hall, 140 Main St., Torrington, Conn.
NIFONG, Forrest, Standard Oil Company, Wood River, Ill.
NIKOLAUS, James D., USGS, 1109 N. Highland St., Arlington, Va.
NILSON, Ellwood R., Nilsen Map Service, 1370 Lobdell Ave., Baton Rouge, La.
NINNEMAN, Jack, Tillacum Ranch, Troy, Mont.
NIXON, Richard W., 721 S. Columbus St., Alexandria, Va.
NOAKES, Alfred H., Jr., U. S. Navy Hydrographic Office, Washington 25, D. C.
NOBLE, Allen G., 4700 Berwyn Rd., College Park, Md.
NOLAN, Dr. Thomas B., USGS, Washington 25, D. C.
NOLEN, Jerry A., 134 Brannan Rd., Aberdeen, Md.
NOLTE, George S., 310 University Ave., Palo Alto, Calif.
NORBY, Emil Alexander, 132 W. Conan St., Ely, Minn.
NORCROSS, Theodore W., 407 Raymond St., Chevy Chase 15, Md.
NORDEN, Henry S., 53 N. Jackson St., Mobile, Ala.
NORGREN, Duane U., USGS, P.O. Box 346, Sacramento 2, Calif.
NORRIS, Clarence, 3100 Wisconsin Ave., N.W., Washington 16, D. C.
NORRIS, L. V., County Surveyor, 704 Courthouse, Beaumont, Tex.
NORTON, Herbert J., Rand McNally & Co., 111 Eighth Ave., New York 11, N. Y.
NORTON, N. C., 70 E. Main St., Patchogue, N. Y.
NOTHSTINE, Leo V., Prof., Civil Engineering Dept., Michigan State College, East Lansing, Mich.
NOTTAGE, Clarence W., USGS, 1109 N. Highland St., Arlington, Va.
NOWAK, Otto G., 910 Phoenix Bldg., Minneapolis, 1, Minn.
NOWICKI, Albert L., 6909 Massachusetts Ave., N.W., Washington 16, D. C.
NOWICKI, Robert A., 3342 N. Harding Ave., Chicago 18, Ill.
NUNEMACHER, Stewart C., R.F.D. 1, Box 977, Largo, Fla.

O

OBER, Chester Howard, THE IRON AGE, 100 E. 42nd St., New York 17, N. Y.
OBERG, S. W., Humble Oil & Refining Co., 1216 Main St., Houston 1, Tex.
O'BRIEN, Charles V., 935 N. Irving St., Arlington, Va.
O'BRIEN, John E., 215 N. Colonial Homes Circle, N.W., Atlanta, Ga.
O'CONNOR, T. L., P.O. Box 252, Lower Lake, Calif.
O'DEA, James C., USGS, P.O. Box 346, Sacramento 2, Calif.
ODELL, Clarence B., Denoyer-Geppert, 5253 Ravenswood Ave., Chicago 40, Ill.
ODLE, J. R., 2123 Malcolm Ave., Los Angeles 25, Calif.
OFENSTEIN, Charles E., 4908 Aurora Dr., Kensington, Md.
OGDEN, Ivan, 4026 McKinley Blvd., Sacramento 16, Calif.
O'HARA, John L., R.F.D. 1, Box 515, Sonora, Calif.
O'KEEFE, Martin S., Jr., P.O. Box 1200, Bakersfield, Calif.
OLDHAM, Herbert G., County Surveyor, R.R. #2, Rockport, Ind.
OLSHESKY, John J., 1652 Main St., East Hartford 8, Conn.
O'MALLEY, Thomas M., Canadian Aero Service Ltd., 348 Queen St., Ottawa, Ont., Canada
O'NEILL, James B., Topographical Survey, #8 Temporary Bldg., Ottawa, Ont., Canada
ORELUP, Ivan C., USGS, Box 133, Rolla, Mo.
OROS, Charles N., 7415 S.E. Madison, Portland 16, Oreg.
OROZCO, Isidro G., 71 Calle Francisco Pimental, Colonia San Rafael, Mexico 4, D. F., Mexico
ORR, Joseph A., Prof., Dept. of Civil Engineering, Texas A & M College, College Station, Tex.
ORRELL, K. P. M., 565 Park Ave., New York 22, N. Y.
ORTIZ, Francis J., 6050 N. 28th St., East Falls Church, Arlington 7, Va.

OSAKA, Walter K., USGS, Box 133, Rolla, Mo.
OSGOOD, G. Robert, Jr., 110 Pleasant St., Malden 48, Mass.
OTTER, John D., R.F.D. #2, Carmel, Calif.
OTTINGER, R. Herchal, Jr., 6105 Ridge Dr., Washington 16, D. C.
OVERSTREET, William B., 3302 Fayette Rd., Kensington, Md.
OWENS, E. H., 2715 Indiana Ave., Kansas City, Mo.
OYARZABAL, Dr. Oscar, Division de Geodesia, Cano Amarillo a Estacion, Edificio Santa Ines, Caracas, Venezuela
OYSTER, Thomas G., 2419 Reedie St., Wheaton Triangle, Wheaton, Md.

P

PABON, Rene, 51 Duarte St., Hato Rey, Puerto Rico
PABST, Victor H., Rm. 270, County Court House, Portland, Oreg.
PAFFORD, F. Wm., 5317 Hollywood Blvd., Hollywood 27, Calif.
PAINE, Robert H., USGS, 1109 N. Highland St., Arlington, Va.
PALM, Richard C., 354 Calvert St., Webster Groves 19, Mo.
PALMER, Howard B., 3904 32nd St., Sacramento 17, Calif.
PALMER, Mrs. Margaret W., Apt. 301, 1137 Patrick Henry Dr., Falls Church, Va.
PAPPMEIER, Louis S., 220 N. Chambers St., Galesburg, Ill.
PARK, Joseph G., Upper River Rd., Washington Crossing, Pa.
PARKER, Carl O., P.O. Box 1084, Knoxville, Tenn.
PARKER, Clyde H., USGS, Box 133, Rolla, Mo.
PARKER, Harry, 3029 Perry St., Denver 12, Colo.
PARKER, Jess M., City Hall, Sweet Home, Oreg.
PARKIN, Ernest J., USC&GS, Washington 25, D. C.
PARR, Clyde L., 1504 Crestmont Dr., Bakersfield, Calif.
PARRISH, George J., City of Richmond Dept. Pub. Works, 217 Govenor St., Richmond 19, Va.
PARRY, William H., 21 Crocus Ave., Floral Park, N. Y.
PARSONS, Harold A., 167 Old North Stamford Rd., Stamford, Conn.
PARTLOW, Ross G., Jr., 1906 Jefferson Dr., Liberty, Tex.
PARTYKA, Prof. John C., Civil Engineering Dept., Wayne Univ., 4841 Cass Ave., Detroit 1, Mich.
PASQUINELLI, Salvatore, Natl. Survey Service, Inc., 134 N. LaSalle St., Chicago 2, Ill.
PATES, John R., Jr., 3415 38th St., N.W., Washington 16, D. C.
PATHE, Carl, 218 S. Albert St., Mt. Prospect, Ill.
PATRICK, William R., Dept. of Assessment, Nassau County, 198 Cherry St., Farmingdale, N. Y.
PATTEN, Frank E., Jr., USGS, 1109 N. Highland St., Arlington, Va.
PATTERSON, James A., Pennsylvania State Planning Board, Harrisburg, Pa.
PATTERSON, James L., P.O. Box 209, Bedford, Va.
PATTERSON, Michel B., 1727 Sansom St., Philadelphia 3, Pa.
PATTILLO, Col. Lewis C., P.O. Box 348, Hartselle, Ala.
PAVITT, Robert W., Pine Shores Trailer Park, Sarasota, Fla.
PAXSON, R. K., Sun Oil Co., Box 850, Jackson, Miss.
PEACOCK, Capt. Frederic L., 227 58th Ave. S., St. Petersburg, Fla.
PEETS, Spencer H., 11 Bayview Ave., Manhasset, N. Y.
PELISHEK, Ray P., 80 Elm St., Clintonville, Wis.
PELLETREAU, John R., P.O. Box 774-E, Patchogue, L. I., N. Y.
PEMBERTON, Carlysle, 2537 S. 6th St., Springfield, Ill.
PENN, Prof. John C., 11127 S. Park Ave., Apt. 3, Chicago 28, Ill.
PENNINGTON, John T., Photogrammetric Section, The Engr. Research & Development Lab., Fort Belvoir, Va.
PENNY, Frank C., 155 Island Brook Ave., Bridgeport, Conn.
PENYAPOL, Lt. Amporn, c/o F. J. Ortiz, USC&GS, Washington 25, D. C.
PERA, Arthur H., 1211 E. First St., Duluth 5, Minn.
PEREZ, Prof. Lawrence, 255 Woodland Dr., State College, Pa.
PERKINS, Basil C., 4610 Reach St., Philadelphia 20, Pa.
PERKINS, E. Winton, USGS, 1109 N. Highland St., Arlington, Va.
PERKINS, Everett R., 1754 17th St., Corpus Christi, Tex.
PERLENFEIN, Arthur, 2236 Ralston Rd., Sacramento 15, Calif.
PERRI, Maria T., #1108, 2800 Quebec St., N.W., Washington 8, D. C.
PERRY, Clyde H., 14 Executive Dr., R.F.D. 1, Falls Church, Va.
PESCE, Frank, Ferro-Monte Ave., Kenvil, N. J.
PETERS, F. H., 33 Main St., Aylmer East, P. Q., Canada
PETERSON, E. R. T., 203 City Hall, Minneapolis 15, Minn.
PETERSON, H. F., 1008 W. Sixth St., Los Angeles 17, Calif.
PETERSON, Harold N., 219 Roberts Bldg., Jamestown, N. Y.
PETERSON, L. K., USGS, P.O. Box 346, Sacramento 2, Calif.
PETERSON, Robert A., 2108 W. Wisconsin Ave., Milwaukee 11, Wis.
PETERSON, Vernon R., Peterson Engineering Co., P.O. Box 49, Missoula, Mont.
PFEIFER, Raymond S., 1240 Maidens Choice Rd., Baltimore 29, Md.
PFLEIDERER, Frank Clifford, 8 Kenneth Ave., Bellmore, N. Y.
PFLEIDERER, Peter L., Jr., 93 Nassau Rd., Roosevelt, N. Y.
PHILLIPS, Charles W., c/o Aramco, Dhahran, Saudi Arabia
PHILLIPS, W. M., 814 Main St., Mt. Vernon, Ill.
PICK, W., Esq., P.O. Box 1067, Tel-Aviv, Israel
PINKERTON, Daniel L., USGS, P.O. Box 346, Sacramento 2, Calif.
PINKSTON, Delmar W., USGS, 1109 N. Highland St., Arlington, Va.
PINKSTON, Samuel W., USGS, Box 133, Rolla, Mo.
PIPPIN, Ralph R., 3107 Moore Ave., Anniston, Ala.
PIROLA, Antonio P., Forest Farm, Ashburn, Va.
PLATT, Norman B., AEC, Route 4, Grand Junction, Colo.
PLATT, Wayne K., USGS, P.O. Box 346, Sacramento 2, Calif.
PLAYFOOT, Charles, 884 Wayne Ave., Indiana, Pa.
PLOETZ, Alfred L., USGS, P.O. Box 346, Sacramento 2, Calif.
POHMER, Albert E., 833 Park Ave., Baltimore 1, Md.
POLING, Arthur A., Jr., 307 Pennsylvania Ave., Bridgeport, W. Va.
POLING, Murray Y., 106 N. Wayne St., Arlington, Va.
POLLEY, E. R., Fairchild Aerial Surveys, Inc., 224 E. 11th St., Los Angeles, Calif.
POMPONIO, Arthur R., 2222 Wilson Blvd., Arlington, Va.
PONTON, Samuel, Route 3, Box 241, Vista, Calif.
POPE, Frank H., Kentucky Utilities Co., South Carrollton, Ky.
POPE, John G., 2116 Ojemann Rd., Houston 24, Tex.
PORAL, Ariston O., Philippine Coast & Geodetic Survey, Manila, Philippines
PORTER, Justus J., Patterson, Pierce County, Ga.

PORTER, Norman, Asst. Prof., Civil Engineering, New York Univ., University Heights, New York 53, N. Y.

PORTER, Thomas P., Jr., The California Co., Box 1744, Shreveport, La.

POSTEL, August F., 427 W. Lincoln Ave., Oakhurst, N. J.

POU, James F., Box 5067, State College Station, Raleigh, N. C.

POWELL, Allen L., Lt., USC&GS, Washington 25, D. C.

POWELL, Gilbert S., Route 1, Box 1477, La Mesa, Calif.

POWER, Joseph G., 18 Linden Court, Brookline 46, Mass.

POWERS, A. Thomas, 1744 Wymore Ave., East Cleveland, Ohio

PRANIS, Peter E., Kingston Rd., Princeton, N. J.

PRAUGHT, Clarence H., Route 1, Box 399, Fair Oaks, Calif.

PRESTON, Harold A., 5 Commercial Bldg., Mt. Pleasant, Mich.

PRESTON, Howard W., 832 Hodapp Ave., Dayton, Ohio

PRICE, Allan E., USGS, Box 133, Rolla, Mo.

PRICE, E. E., Eugene Dietzgen Co., 2425 Sheffield Ave., Chicago 14, Ill.

PRICE, Frederick Somers, P.O. Box 1174, Wilmington, Del.

PRICE, Milton M., 7240 Wisconsin Ave., Bethesda, Md.

PRIGMORE, William A., Jr., 106 Lynda Dr., Chattanooga, Tenn.

PRIMROSE, William H., R. 4, Box 92, Baltimore 27, Md.

PRITCHETT, Norman M., State Roads Comm., 108 E. Lexington St., Baltimore 3, Md.

PRIVETT, John C., 444 E. 45th St., Jacksonville 6, Fla.

PROUTY, Winfred L., 320 Ivy St., Denver 7, Colo.

PRYOR, William T. 1136 N. Powhatan St., Arlington, Va.

PULVER, John W., 355 Winthrop Ave., New Haven, Conn.

PUMPELLY, J. W., USGS, Washington 25, D. C.

PURVIS, John A., 16424 Community St., Supulveda, Calif.

PYLE, Albert L., U. S. Soil Conservation Service, Albion, Ind.

PYLE, R. F., P.O. Box 911, Newport News, Va.

Q

QUERFELD, Dale W., 15834 Monte Vista, Detroit 21, Mich.

QUINN, Alfred O., 513 Burton Rd., Oreland, Pa.

R

RABITO, F. J., Box 2031, I.A.G.S., Balboa Heights, Canal Zone

RACELY, Wilbur A., County Surveyor, Pender, Nebr.

RADER, Leo W., 38 Belfast Rd., Timonium, Md.

RAINS, Leslie J., Shell Oil Co., Box 2099, Houston, Tex.

RAISZ, Dr. Erwin, 107 Washington Ave., Cambridge, Mass.

RALSTON, Harry James, 65 Bergen Ave., Ridgefield Park, N. J.

RAMLOW, W. G., 547 S. Saratoga St., St. Paul, Minn.

RANDALL, Fred R., USGS, P.O. Box 346, Sacramento 2, Calif.

RANDALL, Robert H., 4009 East-West Hwy., Chevy Chase 15, Md.

RANDALL, Robt. H., Jr., 100 Cedar Dr., S.E., Washington 20, D. C.

RANDALL, William E., Lt., USC&GS, Washington 25, D. C.

RANHOFER, Charles A., Knox & Garvin Engrs.—Surveyors, 390 E. Fordham Rd., Bronx 58, N. Y.

RANNEY, T. T., USGS, Box 133, Rolla, Mo.

RANSOM, John G., USGS, Box 133, Rolla, Mo.

RAPPLEYE, Howard S., 6712 4th St., N.W., Washington 12, D. C.

RASCHE, Lt. Col. Herbert H., GSC, c/o OMA U. S. Navy 100, FPO, New York, N. Y.

RASURE, William A., Box 1689, Tampa, Fla.

RATCLIFFE, R. Jackson, County Surveyor, Manassas, Va.

RAY Robert H., Geophysical Surveys, 2500 Bolsovel Rd., P.O. Box 6557, Houston, Tex.

RAYMOND, Clyde R., 317 Ogden St., Connellsville, Pa.

RAYNER, Prof. W. H., 101 Surveying Bldg., Univ. of Illinois, Urbana, Ill.

READING, Capt. Oliver S., 5107 38th St., N.W., Washington 16, D. C.

REAMER, Charles A., 1103 Custis Parkway, Falls Church, Va.

REAMS, Chatham C., 4713 Old Mission Rd., Chattanooga, Tenn.

REDFERN, John H., 112 Milligan Pl., South Orange, N. J.

REDMAN, Charles C., Jr., P.O. Box 62, Kennett, Mo.

REED, A. C., 2320 Haley, Midland, Mich.

REED, Clarence R., Lt. Comdr., USC&GS, Washington 25, D. C.

REED, Ralph, 130 N. 39th St., Omaha 3, Nebr.

REED, Thomas B., Capt., USC&GS, Washington 25, D. C.

REESE, Woeber J., 118½ 20th St., Rock Island, Ill.

REID, R. L., 2506 Richton St., Houston, Tex.

REIL, Orvis E., Nevada Dept. of Highways, Carson City, Nev.

REILLY, S. E., 36 Dock St., South Brisbane, Queensland, Australia

REMALY, Charles D., 53 E. Broad St., Bethlehem, Pa.

RENNIE, Albert M., P.O. Box 170, Pauls Valley, Okla.

REYNOLDS, Earle J., 637 Main St., P.O. Box 36, Watertown, Conn.

REYNOLDS, K. E., Bausch & Lomb, 635 St. Paul St., Rochester 2, N. Y.

REYNOLDS, William A., 2052 Whitney Ave., Hamden 14, Conn.

RHODES, Charles L., Petroleum Map Co., 5625 Daniels Ave., Dallas, Tex.

RICE, Calvin W., Box 202, Milledgeville, Ga.

RICE, Prof. Paul P., 364 Morris St., Hillcrest Apts., #7, Phillipsburg, N. J.

RICHARDS, Eugene W., Ensign, USC&GS, 705 Federal Office Bldg., Seattle 4, Wash.

RICHARDSON, John R., 2700 Cameron Mills Rd., Alexandria, Va.

RICHARDSON, Samuel C., 1652 Preston Rd., Alexandria, Va.

RICHMOND, Addison E., Assoc. Prof. Civil Engineering, Howard Univ., 2401 6th St., N.W., Washington, D. C.

RICHWINE, Martin W., Jr., 1809 W. 45th St., Richmond 24, Va.

RICKE, Arturo, Lt., Dept. de Navegacion E Hydrografia, Valparaiso, Chile

RIDDELL, Comdr. F. A., Swan Island Postal Station, Portland 18, Oreg.

RIEMER, Arthur A., 3611 Chevy Chase Lake Dr., Apt. 3, Chevy Chase 15, Md.

RIGG, Benjamin H., Lt. Comdr., USC&GS, U. S. Court House, Fort Worth, Tex.

RILEY, Frank C., Park Aerial Surveys, Inc., Standiford Field, Louisville 13, Ky.

RILEY, Frank N., Dodd Rd., R.D. 1, Willoughby, Ohio

RILEY, R. R., P.O. Box 407, Jasper, Fla.

RILEY, Thomas E., 3944 S.W. 36th Pl., Portland 1, Oreg.

RISSO, Joseph J., 555 55th St., Brooklyn 20, N. Y.

RISTOW, Walter W., Division of Maps, The Library of Congress, Washington 25, D. C.

RISVOLD, O. S., USC&GS, Washington 25, D. C.

RITTENBURG, I. E., Commander, USC&GS, Washington 25, D. C.
RITZ, H. F., 875 Janet Ave., Lancaster, Pa.
RIZZO, Joseph A., Fairchild Aerial Surveys, Inc., 21-21 41st Ave., Long Island City, N. Y.
RIZZONI, Walter, Prof., Dpt. Gdsy., Topog., Univ. Palermo, Via Salvatore Meccio 22, Palermo, Italy
ROBBINS, Arthur A., P.O. Box 5185, Elizabethtown, N. C.
ROBBINS, Emmon L. V., County Engineer, Ashland, Kans.
ROBBINS, Prof. James Melvin, 83 Maplewood Ave., Maplewood, N. J.
ROBBINS, W. J., 885 N. LaSalle St., Chicago 10, Ill.
ROBERSON, Clifton L., 2118 9th St., Sacramento 18, Calif.
ROBERTS, C. R., 1915 Peachtree Rd., Atlanta, Ga.
ROBERTS, Elliott B., Capt., USC&GS, Washington 25, D. C.
ROBERTS, John G., P.O. Box 884, McAllen, Tex.
ROBERTS, John H., Yolo Engineers & Surveyors Assn., 412 First St., Woodland, Calif.
ROBERTS, Keith, 1400 7th St., Menominee, Mich.
ROBERTS, Ralph G., USGS, Box 133, Rolla, Mo.
ROBERTS, Reon B., 1630 Capitol Ave., Bridgeport, Conn.
ROBERTS, Thomas M., Appalachian Electric Power Co., P.O. Box 2091, Roanoke 9, Va.
ROBERTS, Van, Seismograph Service Corp., Box 1590, Tulsa, Okla.
ROBERTSON, Astley C., 636 Penn St., Camden 2, N. J.
ROBERTSON, Charles D., 301 State Bldg., Los Angeles 12, Calif.
ROBERTSON, John F., McLean Rd., Oswego, N. Y.
ROBERTSON, W. G., Surveys & Mapping Branch, Geodetic Survey Bldg., 980 Carling Ave., Ottawa, Ont., Canada
ROBINSON, Prof. Arthur H., 320 Science Hall, Univ. of Wisconsin, Madison, Wis.
ROBINSON, Berry A., Box 162, Fort Belvoir, Va.
ROBINSON, Fred A., Base Development, Box 532, Agana, Guam
ROBINSON, H. C., 311 Main St., Worcester, Mass.
ROBINSON, Raymond W., 210 E. 153rd St., Harvey, Ill.
ROBINSON, William B., Atlantic Refining Co., P.O. Box 2819, Dallas, Tex.
ROBISON, H. O., 1263 Albemarle Ave., N. E., Atlanta 6, Ga.
ROBISON, Leslie Brant, USGS, Box 133, Rolla, Mo.
RODGERS, Mark A., The Ohio Power Co., Canton 2, Ohio
ROELOFS, Prof. R., Hof van Deltlaan 118, Delft, Netherlands
ROLL, L. G., 109½ E. Broadway, Monticello, Ind.
ROLLMAN, Charles William, 302 Pine St., Green Bay, Wis.
ROMERO, Dr. Adolfo C., Edificio Santa Ines, Cano Amarillo, Caracas, Venezuela
ROMIG, Walter W., 853 Ridge Rd., Falls Church, Va.
ROOKUS, Harvey E., 1604 El Toro Dr., Bakersfield, Calif.
ROSENBAUM, Lt. Col. Charles R., Hq. 803, Engr. Avn. Bn., APO 147, c/o Postmaster, New York, N. Y.
ROSENBAUM, Marcus A., 3402 Tulane Dr., Apt. 3, West Hyattsville, Md.
ROSS, Burgess, 244 W. Church St., Ligonier, Pa.
ROSS, Charles F., 14521 Evanston, Detroit 24, Mich.
ROSS, Lt. Leroy E., Jr., 3200 Photographic Test Sqdn., 3200 Test Sup. Gp., Eglin Air Force Base, Fla.
ROSS, Ralph R., USGS, Box 133, Rolla, Mo.
ROTH, Paul E., 649 S. Olive St., Los Angeles 14, Calif.
ROTHER, John F., 2109 Ave. "G," Bay City, Matagorda, Tex.
ROTHER, Walter M., USGS, Box 133, Rolla, Mo.
ROUDABUSH, Martin A., 532 Roxboro Pl., N.W., Washington 11, D. C.
ROUNDS, W. A., 1710 Fair Bldg., Ft. Worth, Tex.
ROWDEN, Herman R., 20 Rolla Gardens, Rolla, Mo.
ROWE, T. Donald, 2305 Elm St., Stratford, Conn.
ROWELL, Eleanor M., 8159 Riverside Dr., Powell, Ohio
ROWLAND, John B., USGS, P.O. Box 346, Sacramento 2, Calif.
ROY, C. Wayne, 300 E. Fifth St., Rolla, Mo.
RUBEY, Harry, Prof., Dept. of Civil Engineering, 151 Engineering Bldg., Univ. of Missouri, Columbia, Mo.
RUDOLPH, Harry R., 3935 Lowndes Ave., Baltimore 18, Md.
RUDY, S. H., Route #1, Hammond, W. Va.
RUHLOFF, R. A., c/o David White Co., 315 W. Court St., Milwaukee 12, Wis.
RUNGE, Frederick P., 430 71st St., North Bergen, N. J.
RUNYAN, Russell H., USGS, Washington 25, D. C.
RUSSUM, C. W., Box 383, Fuquay Springs, N. C.
RUTH, Leo W., Jr., 919 The Alameda, San Jose 26, Calif.
RUTLEDGE, Dwight H., USGS, P.O. Box 346, Sacramento 2, Calif.
RYAN, J. Patrick, USGS, Box 133, Rolla, Mo.
RYBA, Henry H., 1437 National Bank Bldg., Detroit 5, Mich.
RYKER, Harrison C., 6015 Contra Costa Rd., Oakland 18, Calif.

S

SABO, Eugene L., P.O. Box 444, Rolla, Mo.
SALLE, James H., 18400 Northlawn Ave., Detroit 21, Mich.
SALZER, Theodore, 315 W. Court St., Milwaukee 12, Wis.
SANCHEZ, Pedro C., Inst. Panamerican Da Geographia E Historia, Av Observatories 192, Tacubaya, D. F., Mexico
SANDERS, Bernard, USGS, Box 133, Rolla, Mo.
SANDERS, Ira T., USC&GS, Washington 25, D. C.
SANDERS, Revere G., Fairchild Camera & Instrument Corp., 88-06 Van Wyck Blvd., Jamaica 1, N. Y.
SANDLIN, H. A., c/o Joseph E. Spink, 408 Calif. Fruit Bldg., Sacramento, Calif.
SANDOVAL, Pete, County Surveyor, Los Lunas, N. Mex.
SANDQUIST, Walter E., County Surveyor, Court House, Vale, Oreg.
SANGSTER, J. Gilbert, 2133 K St., N.W., (Rear), Washington 7, D. C.
SANKER, Freeman C., 690 Lakeview Rd., Cleveland, Ohio
SARGENT, Charles, Prof., Civil Engineering Dept., Univ. of Idaho, Moscow, Idaho
SARGENT, Loren J., 2046 Canal Dr., Redding, Calif.
SARGENT, R. L., M & M Bldg., Houston, Tex.
SARLIN, William O., 6031 California St., San Francisco 21, Calif.
SARTAIN, Raymond R., Gulf Oil Corp., P.O. Box 2100, Houston 1, Tex.
SAUCERMAN, Mrs. Sophia A., Office of the Geographer, Dept. of State, Washington, D. C.
SAUNDERS, Howard R., 6843 Chisholm Ave., Van Nuys, Calif.
SAUNDERS, Randall N., 10408 Woodbridge St., N. Hollywood, Calif.
SAVAGE, Frank D., Gulf Oil Corp., P.O. Box 2100, Houston 1, Tex.
SAVAGE, William E., Jr., 27 Washington Ave., Thompsonville, Conn.
SAVARD, Paul, A. G. I. F., 1233 Rousseau Ave., Quebec, P. Q., Canada
SAWCHUK, Henry A., 2412 59th Pl., Cheverly, Md.

SAX, Kenneth W., USGS, P.O. Box 346, Sacramento 2, Calif.
SAYER, Robert E., 6213 N. 30th, Arlington, Va.
SCALES, Walter P., 347 Jefferson Ave., Alexandria, Va.
SCHAEFER, Prof. Alfred, 8910 107th Ave., Ozone Park 17, N. Y.
SCHAEFFER, M. B., 228 N. LaSalle St., Chicago 1, Ill.
SCHANCK, Charles A., Commander, USC&GS, Washington 25, D. C.
SCHARPER, James E., P.O. Box 2028, Clarksburg, W. Va.
SCHENCK, Walter H., 149-48 Delaware Ave., Flushing, N. Y.
SCHENK, Walter, 3714 W. 128th St., Cleveland 11, Ohio
SCHERBEL, Paul N., U. S. Soil Conservation Service, Box 96, Big Piney, Wyo.
SCHERMERHORN, Prof. Dr. W., Lassuslaan 39, Bilthoven, Netherlands
SCHERPBIER, B., Van Voorschotenlaan 9, The Hague, Netherlands
SCHICK, Lawrence E., Col., Dept. Military Topog. & Graphics, United States Military Academy, West Point, N. Y.
SCHILLING, Howard A., 6108 Grove St., Oakland 9, Calif.
SCHIVE, Jacob, Lt. Col., Militaere Kartkonter, Festningen, Oslo, Norway
SCHLEI, Elmo W., 834 Hubbard St., Green Bay, Wis.
SCHMAHL, Edward L., 5229 W. 20th St., Los Angeles, Calif.
SCHMIDT, Prof. Milton O., 103 Surveying Bldg., Univ. of Illinois, Urbana, Ill.
SCHMIEDER, E. Henry, 1109 Third Ave., Spring Lake, N. J.
SCHMINKY, Harold B., Rm. 401, City Hall, Portland 4, Oreg.
SCHMITT, Albert C., Service Surveying & Engrg. Co., Eng. Bldg., 205 W. Wacker Dr., Chicago 6, Ill.
SCHMUHL, Karl, USC&GS, Washington 25, D. C.
SCHNEIDER, John R., 20675 Morewood Parkway, Rocky River 16, Ohio
SCHOENAGEL, Fred C., County Surveyor, Greentown, Pa.
SCHOFIELD, Calvin O., Gilboy, O'Malley & Stopper, c/o Air Installation Officer, 3rd Air Force, APO 125, New York, N. Y.
SCHOFIELD, Llewellyn T., Schofield Bros., Rm. 10, Smith Bldg., Framingham, Mass.
SCHOFIELD, Roy M., Dept. of Lands & Forests, 11 Pleasant St., Dartmouth, Nova Scotia
SCHOFIELD, Winford L., Main St., Orleans, Mass.
SCHOOLER, Morris, 3 Green Acres, Rolla, Mo.
SCHORP, Frank J., Pearsall, Tex.
SCHREINER, Gilbert O., USGS, Box 133, Rolla, Mo.
SCHREITER, Jesse B., 94 W. Como Ave., Columbus 2, Ohio
SCHRINNER, William P., P.O. Box 617, Princeton Ave., Bluefield, W. Va.
SCHULTZ, A. Dale, USGS, P.O. Box 346, Sacramento 2, Calif.
SCHULTZ, Jack T., Box 555, Rolla, Mo.
SCHUMAKER, Robt. G., 2833 Verna Way, Sacramento, Calif.
SCHURR, Donald H., 1220 Powell St., Norristown, Pa.
SCHUSTER, Frank P., 434 Washington Ave., Titusville, Fla.
SCHWANEWEDE, William H., 201 The Plaza, Teaneck, N. J.
SCHWARTZ, Bruce Lewis, USGS, Denver Federal Center, Denver, Colo.
SCHWEBKE, Harry C., 4119 N.W. 2nd Ave., Miami, Fla.
SCIAMBI, Bruno E., Lucadian Cartographers, 4745 Griscom St., Philadelphia 24, Pa.
SCOTT, David K., U. S. Bureau of Land Management, 1245 N. 29th St., Billings, Mont.
SCOTT, Harry E., 10 S. Maple St., Westfield, Mass.
SCOTT, J. Lewis, P.O. Box 2038, Pittsburgh 30, Pa.
SCOTT, John P., Jr., USGS, 1109 N. Highland St., Arlington, Va.
SCOTT, Louis S., 135 Bidwell Ave., Jersey City 5, N. J.
SCOTT, Robert S., 405 River St., Alpena, Mich.
SCOTT, Ronald F., 317 City Hall, Greensboro, N. C.
SCOTT, Winford G., County Surveyor, P.O. Box 285, Sandusky, Mich.
SCOVILLE, Rulon S., 1414 Columbia Pike, Arlington, Va.
SCRUGGS, Mack O., Indian Valley Light & Power Co., P.O. Box 126, Greenville, Calif.
SEABORG, Harold J., Lt. Comdr., USC&GS, Rm. 418, P.O. Bldg., Norfolk 10, Va.
SEAMANS, Arthur E., Factoryville, Pa.
SEAQUIST, Edgar O., Route 3, Gaithersburg, Md.
SEARS, William B., 225 Gallatin St., N.W., Washington 11, D. C.
SEELY, Floyd, 825 Hudson Dr., Bakersfield, Calif.
SEELY, Harold E., Forestry Br., Dept. Resources & Dev., Motor Bldg., 238 Sparks St., Ottawa, Ont., Canada
SENECHALLE, Lester J., 2240 W. 113th St., Chicago, Ill.
SENSENEY, Harry S., USGS, Washington 25, D. C.
SERVESON, Edwin H., 2704 79th Ave., District Heights, Washington 19, D. C.
SESSIONS, J. P., Vidalia, La.
SEVIAN, Vahe Joseph, Karadat Maryam No. 5/2/4, Baghdad, Iraq
SEWARD, Vernon S., USGS., P.O. Box 346, Sacramento 2, Calif.
SHAFER, Paul C., Box 470, Ravenna, Ohio
SHALOWITZ, Aaron L., 1520 Kalmia Rd., N.W., Washington, D. C.
SHAPIRO, Samuel E., Prof., Univ. of Illinois, Navy Pier, Chicago 11, Ill.
SHARP, John V., Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.
SHARP, H. Oakley, Prof., Rensselaer Polytechnic Inst., Troy, N. Y.
SHARPE, Lem, 5116 N. Shepherd Dr., Houston 18, Tex.
SHARTLE, Stanley M., P. O. Box 56, Danville, Ind.
SHAW, Edgar M., Jr., Spencerville, Montgomery County, Md.
SHAW, G. Reed, R.F.D. #4, Troy, N. Y.
SHEA, Herman J., Prof., Mass. Institute of Technology, Cambridge, Mass.
SHEARER, Norville E., Bur. Land Management, Dept. of Interior, Washington 25, D. C.
SHEARIN, Jacob C., Imperial Theatre Bldg., Roanoke Rapids, N. C.
SHELTON, Clarence A., USC&GS, Washington 25, D. C.
SHELTON, Robert F., 826 Main St., Racine, Wis.
SHEPHERD, George P., USGS, 1109 N. Highland St., Arlington, Va.
SHEPHERD, Richard, 29th Engr. Base Topo. Bn., APO 928, San Francisco, Calif.
SHEPPARD, Jack L., c/o Simpson Logging Co., Klamath, Calif.
SHEPPARD, William E., City Bureau of Engineering, 5342 La Mirada Ave., Los Angeles 29, Calif.
SHERFESEE, Charles M., Box 840, Wichita Falls, Tex.
SHERIDAN, Frank J., 11 Lacotah Bldg., Sioux Falls, S. Dak.
SHERMAN, Sidney, 1660 Lanier Pl., N.W., Washington 9, D. C.
SHETEROM, Victor E., Saxton, Pa.
SHIELDS, James J., Jr., 107 Mineola Blvd., Mineola, N. Y.
SHIELDS, John M., USGS, Box 133, Rolla, Mo.
SHOEMAKER, William L., Joppa Rd., Oak Summit, Fullerton, Md.
SHOFNOS, William, USC&GS, Washington 25, D. C.

SHORTT, Quentin R., 1239 Holbrook Terrace, N.E., Washington 2, D. C.
SHRUM, Guy, 204 E. Hackberry St., Salem, Ind.
SHU, Chi San, 317 Eddy St., Ithaca, N. Y.
SHULZE, Eugene R., USGS, Box 133, Rolla, Mo.
SHUMATE, John A., USGS, Box 133, Rolla, Mo.
SICKELSTEEL, Milton E., Jr., 22546 Alexander Dr., St. Clair Shores, Mich.
SIEKER, Robert W., Jr., 645 Third Ave., San Francisco, Calif.
SIELKE, Alan L., Pascack Rd., Woodcliff Lake, N. J.
SIHLER, Oscar F., U. S. Dept. of Interior, Valdez, Alaska
SILCOX, Ernest Stephen, 778 Parkway Dr., N.E., Atlanta, Ga.
SILVA M., Manuel, Calle 13, #9–13, Bogota, Colombia
SILVERMAN, Jacob, c/o Elks Club, 607 S. Parkview St., Los Angeles, Calif.
SIMMONS, Henry E., USGS, Washington 25, D. C.
SIMMONS, John W., USGS, Box 133, Rolla, Mo.
SIMMONS, Lansing G., USC&GS, Washington 25, D. C.
SIMMONS, Leonard G., USGS, 1109 N. Highland St., Arlington, Va.
SIMONDS, Colwert P., 2092 Burton St., San Diego, Calif.
SIMONPIETRI, Dr. Andre C., 4828 Drummond Ave., West Chevy Chase 15, Md.
SIMONSEN, Dr. Ove, Drosselvej 18, Copenhagen F, Denmark
SIMONSON, Wilbur H., 4503 Middleton Lane, Bethesda 14, Md.
SIMPSON, George R., 1310 E. 15th St., Casper, Wyo.
SINCLAIR, J. K., Box 354, Gloucester, Va.
SIPE, Riley J., Commander, USC&GS, 705 Federal Office Bldg., Seattle 4, Wash.
SISSON, Loren R., 313 W. Eleventh Ave., Escondido, Calif.
SITES, L. E., 1503 Holloway St., Rolla, Mo.
SIZEMORE, William R., 206–11 Patterson Bldg., Tallassee, Ala.
SKELTON, Capt. Ray H., 6703 44th Ave., Hyattsville, Md.
SKILTON, H. Irving, Municipal Bldg., 550 Main St., Hartford, Conn.
SKINNER, Claude Matthews, Jr., College Ave., Ellicott City, Md.
SKOOGLUM, O. J., 750 E. Maryland Ave., St. Paul, Minn.
SKOP, Jacob, 912 Malcolm Dr., Silver Spring, Md.
SLAYTER, Rudolf S., Lexington St., Weston 93, Mass.
SLOAN, Ivan I., 7528 Flight Ave., Los Angeles 45, Calif.
SLOAN, W. N., Franklin, N. C.
SLOCUM, Ralph G., 1342 Mulberry W., San Antonio, Tex.
SLONE, Alvin, Alaska Road Comm., Juneau, Alaska
SMALL, James B., Route 1, Box 248-A, McLean, Va.
SMART, L. Ray, USGS, Washington 25, D. C.
SMIRNOFF, Michael V., Dept. of Engineering, Univ. of California, Los Angeles, Calif.
SMITH, Albert G., 503 Fairview Ave., Shelbyville, Tenn.
SMITH, Alfred H. B., 271 Whittier Ave., Floral Park, N. Y.
SMITH, Austin H., Route 7, Box 5243-A, Sacramento 15, Calif.
SMITH, Chas. H., Crawfordville, Ga.
SMITH, Charles Y., 132 Duck Pond Rd., Glen Cove, N. Y.
SMITH, Earl M., 1701 N. Central Ave., Chicago, Ill.
SMITH, Frank D., Box 2025, Tyler, Tex.
SMITH, Harold A., 270 County Court House, Portland 4, Oreg.
SMITH, J. T., Jr., c/o Georgia Power Co., Box 1719, Atlanta 1, Ga.
SMITH, Joseph F. W., USGS, Box 133, Rolla, Mo.
SMITH, Keith R., 4162 Broadway, Sacramento 17, Calif.
SMITH, Lawrence A., Box 2501, 3522 Polk St., Houston, Tex.
SMITH, Owen C., Jr., Hobson Rd., R.R. #2, Ft. Wayne, Ind.
SMITH, Rear Adm. Paul A., USC&GS, Washington 25, D. C.
SMITH, Robert H., 810 W. Church Rd., Elkins Park, Philadelphia 17, Pa.
SMITH, Rohr, County Engineer, Shelby County Court House, Shelbyville, Ind.
SMITH, Stanley G., Magnolia Petroleum Co., Engineering Dept., Dallas, Tex.
SMITH, Stanley R., 611 Gilroy Dr., Santa Cruz, Calif.
SMITH, Thomas E., P.O. Box 202, Gray, Ga.
SMITH, Vern A., 1018 Farmer St., Detroit 26, Mich.
SMITH, Maj. W. A., California Surveying Service, 111 E. Broadway, Glendale 5, Calif.
SMITH, Wenley Q., 612 N. Kalamazoo St., Paw Paw, Mich.
SMITH, William Porter, 1616 Leycross Dr., La Canada, Calif.
SNELGROVE, Fred, Simpson Logging Co., Shelton, Wash.
SNOW, Newell B., 207 Main St., Buzzards Bay, Mass.
SNYDER, David S., County Surveyor, Downieville, Calif.
SOBIERALSKI, V. Ralph, Lt., USC&GS, Washington 25, D. C.
SODERLUND, V. R., 5495 Claremont Ave., Oakland Calif.
SOEHLE, Bernard L., c/o T.V.A., 408 Pound Bldg., Chattanooga, Tenn.
SOEHLE, Wolfram E., Comm, on Regional Planning, 115 Broad St., Hartford, Conn.
SOLLINS, Alfred D., USC&GS, Washington 25, D. C.
SOMERS, James W. V., 1008 Pine St., Rolla, Mo.
SOUDERS, Warren S., Sr., St. Joseph County Bldg. Comm., 711 Ann St., Mishawaka, Ind.
SOUTHARD, Lt. Rupert B., Jr., 53 Spring St., St. Johnsbury, Vt.
SOUTHERLAND, Oswell P., Oxford, N. C.
SOUTHWORTH, Alfred M., 4566 Woolman St., Jacksonville, Fla.
SPAHN, George J., Prof., Dept. of Civil Engineering, Univ. of Dayton, Dayton 9, Ohio
SPARLING, Robert J., Bausch & Lomb Optical Co., 635 St. Paul St., Rochester, N. Y.
SPEER, Harry E., 58 N. Cherrywood Ave., Dayton 3, Ohio
SPEERT, Julius L., USGS, Washington 25, D. C.
SPENCER, George H., USGS, P.O. Box 346, Sacramento 2, Calif.
SPENCER, John W. H., 6200 N. 31st St., Arlington 13, Va.
SPIES, Henry R., USC&GS, Washington 25, D. C.
SPRAY, W. S., Route 1, Box 32, Sheridan, Ark.
SPRENKEL, Jay B., USGS, 1109 N. Highland St., Arlington, Va.
SPRINGSTEEN, Howard L., USGS, Box 133, Rolla, Mo.
SPRY, Fred J., Prof., Civil Engineering School, Lincoln Hall, Cornell Univ., Ithaca, N. Y.
SPURRIER, Freda H., 4640 S. 36th St., B-2, Arlington, Va.
SQUIRE, L. Wendell, Rampasture Rd., Hampton Bays, N. Y.
STAACK, John G., 1520 Webster St., N.W., Washington, D. C.
STALEY, Col. J. J., 1750 16th St., N.W., Washington, D. C.
STANBROUGH, George K., c/o J. A. Jones Const. Co., Tegucigalpa, Honduras
STANFIELD, E. T., Court House, Herber Springs, Ark.
STANLEY, Albert A., 301 Jefferson St., N.W., Washington 11, D. C.

STANLEY, D. R., 48 Addington Square, London, S.E.S., England
STARBUCK, Theodore W., 7504 Halleck St., S.E., Washington 19, D. C.
STASSI, Tannie, 729 Solano Ave., Los Angeles 12, Calif.
STEARNS, Elton O., 60 Virginia Rd., Waltham, Mass.
STEEL, George J., 318 Ardmore Ave., Haddonfield, N. J.
STEIN, Bjoern, Steins Oppmaaling, Karl Johansgt. 5, Oslo, Norway
STEINBERG, Joseph, 2811 W. Strathmore Ave., Baltimore 9, Md.
STEINBRECHER, Harold F., 915 N. West St., Wheaton, Ill.
STEINBRENNER, Ernest, Bank Bldg., Malverne, N. Y.
STEINKAMP, J. C. Harold, 1219 Yonkers Ave., Yonkers 4, N. Y.
STEINMETZ, Leo E., 107 S. Rolla St., Rolla, Mo.
STEPHENS, George M., Jr., 205 Exchange Bldg., 6th & Franklin Sts., Richmond, Va.
STEPHENS, George W., Jr., 5 McCurdy Ave., Towson 4, Md.
STEVENS, Mrs. Lena T., 206 Frankford Hall, 40 Plattsburg Court, N.W., Washington 16, D. C.
STEVENSON, A. M., Riverview Pl., West Newton, Pa.
STEVENSON, Lewis M., USGS, Denver Federal Center, Denver Colo.
STEVENSON, Robert G., USGS, P.O. Box 346, Sacramento 2, Calif.
STEWART, Russell H., USGS, P.O. Box 346, Sacramento 2, Calif.
STICKLE, Gaylord, 318 S. Standard Bldg., Houston, Tex.
STIEFEL, Alfred C., USGS, Washington 25, D. C.
STILL, Ben I., Still, Wildman & Crockett, P.O. Box 2362, Houston 1, Tex.
STINCHFIELD, R. S., 5518 7th Ave., Sacramento, Calif.
STIREWALT, F. S., Box 763, Sonora, Calif.
STITES, Carmel L., USGS, Box 133, Rolla, Mo.
STOCKBRIDGE, Glenn H., Kern County Land Co., P.O. Box 380, Bakersfield, Calif.
STOCKMAN, Walter J., Box 299, R.D. 3, Kent, Ohio
STOCKWELL, Donald M., Box 52, Amherst, N. H.
STOHSNER, Comdr. E. E., 1160 Linden Dr., San Jose, Calif.
STOLLER, Frederick Edward, 3426 Bradford Rd., Cleveland Heights 18, Ohio
STONEMAN, Walter G., Route 2, Fairfax, Va.
STORMS, C. Eric, Aero Service Corp., 236 E. Courtland St., Philadelphia 20, Pa.
STOUT, David L., 335 Pingree Ave., Trenton 8, N. J.
STRAMLER, Jeff W., 403 Milam Bldg., Houston 2, Tex.
STRANG, Charles R., USGS, P.O. Box 346, Sacramento 2, Calif.
STRAW, Leo S., 4702 Cooper Lane, Washington 16, D. C.
STREES, Leo V., 5510 Newton St., Apt. 1, Cheverly, Md.
STREETER, Gaylord H., 6 E. Alexandria Ave., Alexandria, Va.
STRIEKERT, H. F., Gulf Oil Corp., 1307 Gulf Bldg., P.O. Box 2100, Houston, Tex.
STRIEKERT, Roy R., Gulf Oil Corp., 1303 Gulf Bldg., P.O. Box 2100, Houston, Tex.
STRIKER, Arthur F., 1415 N. Edison, Arlington, Va.
STRINGER, Edward, 35110 Brush St., Wayne, Mich.
STROEBEL, Henry J., 2101 Marlowe Ave., Lakewood 7, Ohio
STROUP, R. K., Eagle-Picher Co., Mining and Smelting Div., TriState Mines, Cardin, Okla.
STROUP, Capt. Windsor B. W., 1304 N. Carolina Ave., N.E., Washington 2, D. C.
STUART, Donald G., 3446 Oakwood Terrace, N.W., Washington 10, D. C.
STUDDS, Rear Adm. Robert F. A., USC&GS, Washington 25, D. C.
STURDEVANT, J. E., U. S. Bureau of Reclamation, Box 280, Casper, Wyo.
SUAREZ, Rafael I., P.O. Box 16, Naranjito, Puerto Rico
SULLIVAN, Arthur E., 6 Grove St., Palmer, Mass.
SULLIVAN, John M., 2805 Blair Blvd., Nashville 12, Tenn.
SULLIVAN, Joseph N., E-505 First National Bank Bldg., St. Paul, Minn.
SUMNER, Billy T., P.O. Box 678, Nashville 2, Tenn.
SUPP, Carl W. A., c/o J. E. Greiner Co., 1201 St. Paul St., Baltimore, Md.
SUTCLIFFE, D. K., 3639 Forest Hill Rd., Baltimore, 7, Md.
SUTCLIFFE, Walter D., USC&GS, Washington 25, D. C.
SUVANKES, Xutragool, c/o F. J. Ortiz, USC&GS, Washington 25, D. C.
SUVERKROP, Lew, P.O. Box 436, Bakersfield, Calif.
SWAIM, Carlton H., 326 Chestnut St., Kearny, N. J.
SWANSON, Lawrence W., USC&GS, Washington 25, D. C.
SWARTZ, William H., 3 Fritztown Rd., Lincoln Park, Pa.
SWEET Col. Arthur J., 5 Ardmore Court, Woodacres, Washington 16, D. C.
SWEETZER, Stanley R., Dennisport, Mass.
SWICK, Clarence H., 6120 C St., Capitol Heights, Md.
SWIECH, Paul C., 113 Patterson Ave., Carnegie, Pa.
SWIFT, Calvin E., USGS, 1109 N. Highland St., Arlington, Va.
SWIGART, Sherman T., 307 Second National Bldg., Akron 8, Ohio

T

TAIT, James G., Survey Office, Malacca, Malaya
TANAKA, Harry H., USGS, Box 133, Rolla, Mo.
TANNER, Joseph J., c/o Phillips Petroleum Co., 816 Patterson Bldg., Denver 2, Colo.
TANNER, William S., Jr., USGS, P.O. Box 346, Sacramento 2, Calif.
TARCZA, Frank J., 3610 Edgegreen Ave., Baltimore 11, Md.
TASKER, A. D., 1910 Welch Ave., Houston 19, Tex.
TASSIE, Gilbert C., R.D. 2, Vernon P.O., British Columbia, Canada
TAYLOR, Ivan G., USGS, Box 133, Rolla, Mo.
TAYLOR, James O., 4085 Army St., San Francisco, Calif.
TAYLOR, Leslie S., 618 Main St., Clarion, Pa.
TAYLOR, Warren C., Prof., Union College, Schenectady, N. Y.
TAYLOR, William F., USGS, 1109 N. Highland St., Arlington, Va.
TEAS, Howard J., Homeland Bldg., Malverne, N. Y.
TELLER, Herbert L., Jr., USGS, P.O. Box 346, Sacramento 2, Calif.
TEMPLE, Floyd A., 208 N. Sixth St., West Monroe, La.
TENNANT, James N., USGS, P.O. Box 346, Sacramento 2, Calif.
TERPENING, Frank D., 3214 W. 59th Pl., Los Angeles 43, Calif.
TERRELL, Hugh K., The Champion Paper & Fibre Co., Canton, N. C.
TETLEY, W. R., 2684 North St., Beaumont, Tex.
TEWINKEL, G. C., 8426 Piney Branch Court, Silver Spring, Md.
TEWINKEL, Maurice A., Box 1106, Curundu, Canal Zone
TEX, George N., Hobson Star Route, Rolla, Mo.
THEE, Nick M., P.O. Box 481, Marfa, Tex.
THIEME, Reinhold W., Norwich Univ., Northfield, Vt.

THOMAS Capt. Charles M., Apt. 3, 705 University Ave., S.W., Atlanta, Ga.
THOMAS, Howard E., 5700 Hays St., Apt. 10, Pittsburgh 6, Pa.
THOMAS, Lacon H., 600 W. Ash St., LaFollette, Tenn.
THOMAS, Melvin C., Box 911, Elizabethton, Tenn.
THOMAS, Walter L., USGS, P.O. Box 346, Sacramento 2, Calif.
THOMPSON, Donald H., Box 122, Emmetsburg, Iowa
THOMPSON, Eugene M., USGS, 1109 N. Highland St., Arlington, Va.
THOMPSON, George E., 244 Main St., Derby, Conn.
THOMPSON, Harry F., 214 Buffalo Ave., Takoma Park, Md.
THOMPSON, Henry L., Rm. 555, City Hall, Los Angeles 12, Calif.
THOMPSON, John M., 836 Veronica Dr., Pittsburgh, Pa.
THOMPSON, Mercer V., 1508 Ozark St., Rolla, Mo.
THOMPSON, Morris M., USGS, Washington 25, D. C.
THOMPSON, William C., 1810 Key Blvd., Arlington, Va.
THOMSON, John M., 33 Fifth Ave., Berea, Ohio
THORNE, Samuel, Jr., 115 E. 82nd St., New York, N. Y.
THORNTON, Karl, USGS, P.O. Box 346, Sacramento 2, Calif.
THORNTON, Sam E., 5213 Chestnut Ave., Bellaire, Tex.
THORPE, Clifford A., Jr., 501 Woodlawn Ave., Falls Church, Va.
THORSON, Alvin C., Commander, USC&GS, Washington 25, D. C.
THURSTON, Roy F., 3025 Daniel Lane, Washington, D. C.
TIBBS, Douglas D., USGS, P.O. Box 346, Sacramento 2, Calif.
TIBEY, Edward A., 3904 24th St., Del Paso Heights, Calif.
TIDDENS, Paul Thomas, 1972 Penfold Pl., Northbrook, Ill.
TIEDEMAN, George W., State Highway Dept. Lansing, Mich.
TIFFANY, Ross K., Jr., 810 First Ave., Coulee Dam, Wash.
TOLER, Jack S., 242 Brockenbraugh Court, New Orleans, La.
TOMKINS, Howard C., 101 W. Main St., Babylon, N. Y.
TOMLINSON, James A., Humble Oil & Refining Co., Box 2180, Houston 1, Tex.
TOMLINSON, Lloyd M., 3052 S. Buchanan St., Arlington, Va.
TORBERT, Lynn E., I.A.G.S., Box 2031, Balboa Heights, Canal Zone
TORRES, Julio, Calle del Asilo Sara #1, San Salvador, El Salvador
TOWEY, Leo A., 908 W. 5th St., Grand Island, Nebr.
TOWILL, R. M., 250 Merchant St., Honolulu, Hawaii
TOY, Jimmie A., 2520 Marconi Ave., Sacramento, Calif.
TRACY, James H., USGS, P.O. Box 346, Sacramento, Calif.
TRAVIS, Lee M., c/o Bonneville Power Admin., P.O. Box 3531, Portland 8, Oreg.
TREADWELL, Lt. T. K., 3231-C Terrace Dr., S.E., Washington 20, D. C.
TREMAINE, R. D., P.O. Box 26, Taupo, New Zealand
TREVALLEE, Guy A., USGS, P.O. Box 346, Sacramento 2, Calif.
TRIGG, Abner G., 1800 S. China St., Brady, Tex.
TROJANO, Harold D., R. #2, Glove Hollow, Plymouth, N. H.
TROW, Stanley W., 3250 S. Utah St., Arlington, Va.
TROWBRIDGE, Douglas S., Prof., New York Univ., University Heights, New York 53, N. Y.
TROWBRIDGE, Frederick Jarvis, 35 Coniston Ave., Waterbury 8, Conn.
TUBBS, Lester S., 6506 S.E. 20th Ave., Portland 2, Oreg.
TUDOR, Sidney T., USGS, P.O. Box 346, Sacramento 2, Calif.
TULEY, Frank W., USGS, Box 133, Rolla, Mo.
TUNNICLIFF, Robert G., 109 S. Howell St., Davenport, Iowa
TURNER, Albert W., Pub. Works Office, 4th Naval Dist., Bldg. 1, U. S. Naval Base, Philadelphia, Pa.
TURNER, Clifford E., 801 W. 12th St., Rolla, Mo.
TURNER, Joseph, 27 Lenox St., Worcester, Mass.
TURNER, W. A., Shell Oil Co., P.O. Box 193, New Orleans 3, La.
TURNER, Dr. W. Newton, Western Carolina Teachers College, Cullowhee, N. C.
TURPIN, Robert D., Dept. of Civil Engineering, Univ. of Texas, Austin, Tex.
TUTHILL, H. T., County Supt. of Highways, Port Jefferson, N. Y.
TYGRET, James M., Richfield Oil Co., P.O. Box 470, Long Beach 1, Calif.
TYLER, Glenn E., P.O. Box 23, Lakeview, Oreg.
TYSON, James L., 28 Rip Van Winkle Way, Buzzards Bay, Mass.

U

ULLIAN, H. B., New England Survey Service, 51 Cornhill St., Boston 8, Mass.
ULLON, Melvin R., 618 Beverly Dr., Alexandria, Va.
UNDERWOOD, Prof. Paul H., 960 E. State St., Ithaca, N. Y.
UPP, Orville T., 1707 Albia Rd., Ottumwa, Iowa
UPTON, William B., Jr., USGS, Denver Federal Center, Denver, Colo.
UZEFOVICH, Alexis M., Gen., Dayton, Tenn.

V

VALENCIA, Luis F., Carrera 19 No. 51-68, Bogota, Colombia
VALOIS, Leon, Quebec Dept. of Mines, Parliament Bldgs., Quebec, P. Q., Canada
VAN ASCH, Henry Piet Drury, P.O. Box 287, Hastings, New Zealand
VAN BRUNT, Emil E., USGS, 1109 N. Highland St., Arlington, Va.
VAN CAMP, Channing P., USGS, P.O. Box 346, Sacramento 2, Calif.
VANDEWATER, William H., Vandewater & Lapp, 2111 Mott Ave., Far Rockaway, N. Y.
VAN DYKE, A. J., Texas Highway Dept., P.O. Box 387, Jacksboro, Tex.
VAN MEER, Ernest, 2828 E. 78th St., Chicago 49, Ill.
VANN, H. J., Wallace, N. C.
VAN SCHOICK, Maj. A. W., Jr., Box 84, Abbot Hall, Ft. Belvoir, Va.
VAN TUYL, Otto W., Main & Front Sts., Greenport, N. Y.
VAN WEELE, Peter J., 543 Main St., Islip, Suffolk County, N. Y.
VAUGHAN, Donald F., USGS, P.O. Box 346, Sacramento 2, Calif.
VAUGHAN, Edward, L.A.C.F.C. Dist., 751 S. Figueroa St., Los Angeles 14, Calif.
VAUGHAN, Henry, Route 7, Box 1230, Sacramento, Calif.
VAUGHAN, Robert W., USGS, 1109 N. Highland St., Arlington, Va.
VELA, Gonzalo Medina, Calle Alpes 51, Colonia Observatorio, Tacubaya, Mexico
VENA, Francis P., USGS, 1109 N. Highland St., Arlington, Va.
VENABLE, Allen L., Jefferson, Ga.
VENEZKY, Milton S., 2213 Tecumseh St., Hyattsville, Md.
VENNELL, Percy H., 5502 Myrtle Ave., S.E., Washington 20, D. C.
VERNER, Park L., 460 Park Ave., San Jose, Calif.

VERRILL, George, 6 N. Edgewood Ave., La Grange, Ill.
VIDELA, Carlos Corti, Calle Nueva No. 165, Lotes de la Reta, Mendoza, Argentina
VIDMAR, Albin L., USGS, Denver Federal Center, Denver, Colo.
VINSON, Gordon R., 6664 Peachtree-Dunwoody Rd., Dunwoody, Ga.
VLIET, George B., 416 Lee Pl., Plainfield, N. J.
VOEGELIN, Philip F., P.O. Box 33, Village Station, 150 Christopher St., New York 14, N. Y.
VOGEL, Edward C., Army Map Service, 6500 Brooks Lane, Washington 16, D. C.
von SAUERS, Russell J., 189 E. Main St., Port Jervis, N. Y.
VOORHIS, Chester E., Edwin S. Voorhis & Son, Inc., 288 Sunrise Highway, Rockville Centre, N. Y.
VOSKUIL, Robert J., Route 3, Vienna, Va.
VREELAND, Robert P., Prof., Dept. of Civil Engrg., Yale Univ., New Haven, Conn.

W

WADDILL, George B., 1252 Ridge Ave., Lakewood, N. J.
WADDILL, J. P., Box 614, Conroe, Tex.
WADE, Clarence, Jr., USGS, 1109 N. Highland St., Arlington, Va.
WAGERS, Frank E., 507 Fig St., Bakersfield, Calif.
WAGNER, Eldon C., Prof., Civil Engineering Dept., Univ. of Wisconsin, Madison, Wis.
WAHLEN, Hans S., Kern & Co., 815 Edinburgh St., San Mateo, Calif.
WAITE, James E., 43 Sutter St., San Francisco 4, Calif.
WAKEFIELD, Ernest J., Bur. of Public Roads, Washington 25, D. C.
WALBERG, H. O., County Road Engineer, Court House, Mount Vernon, Wash.
WALKER, Henry D., 4857 Williamsburg Blvd., Arlington, Va.
WALKER, Lee B., 1204 Spring Ave., Rolla, Mo.
WALKER, Prof. Leonard D., 210 Transportation Bldg., Univ. of Illinois, Urbana, Ill.
WALKER, N. Glenn, 820 Fifth Ave., Greensboro, N. C.
WALKER, Tom, Box 336, Glenwood Springs, Colo.
WALKER, Wilmot L., USGS, P.O. Box 346, Sacramento 2, Calif.
WALLACE, Dallas C., 1602 Cedar St., Rolla, Mo.
WALLACE, Dwain M., 144 Fredonia Ave., Peoria, Ill.
WALLACE ENGINEERING CO., 144 Fredonia Ave., Peoria, Ill.
WALLER, Harold H., Hubbell & Waller Eng. Co., 216 Ward St., Seattle 9, Wash.
WALSH, William C., 1124 Miller St., Angleton, Tex.
WALSTON, Virgil A., Humble Oil & Refining Co., P.O. Box 2180, Houston 1, Tex.
WALTER, William R., 19 E. Patrick St., Frederick, Md.
WARD, Charles E., 17 Maple Dr., Great Neck, N. Y.
WARD, Earl B., Trans-Arabian Pipe Line Co., Box 1348, Beirut, Lebanon
WARD, Victor A., c/o Orinoco Mining Co., Apartado No. 3, Ciudad Bolivar, Venezuela
WARD, Willard C., 2124 N. Brandywine St., Arlington 7, Va.
WARDIN, R. W., 1009 W. 20th St., Cedar Falls, Iowa
WARDWELL, Arthur L., Lt. Comdr., USC&GS, Washington 25, D. C.
WARE, Clarence L., 6101 W. 67th Terrace, Overland Park, Kans.
WARNOCK, Mrs. Madeline D., 1025 Milwaukee Way, Denver 9, Colo.
WARREN, William J., 601 City National Bldg., Houston, Tex.
WASHBURN, R. A., County Surveyor, Courthouse, Houston 2, Tex.
WATERFALL, Harley A., 149 21st Ave., San Francisco 21, Calif.
WATERS, Cyril C., Route 1, Box 134-A, Roanoke Rapids, N. C.
WATKINS, James L., USGS, Washington 25, D. C.
WATKINS, Pettus V., Route 1, Box 14, Bay City, Tex.
WATSON, Dallas H., USGS, Washington 25, D. C.
WATSON, Gerald M., c/o Maynard Savings Bank, Hazelton, Iowa
WATSON, James T., 1217 Romeria Dr., Austin 5, Tex.
WATSON, Richard E., USGS, P.O. Box 346, Sacramento 2, Calif.
WATSON, William P.O. Box 1143, Springfield, Ill.
WATTLES, Gurdon H., 1435 S. Birch St., Santa Ana, Calif.
WATTLES, William C., 1653 Santa Barbara Ave., Glendale 8, Calif.
WATTS, Richard G., Magnolia Petroleum Co., P.O. Box 900, Dallas 1, Tex.
WAY, Alfred F., 88 Clifton Ave., Springfield 5, Mass.
WEAN, Ezra L., Jr., 12 Delaware Ave., Milford, N. J.
WEATHERBY, Raymond C., Sr., Fern & Bozarth Sts., Glendora, N. J.
WEAVER, Darrell A., 84 Village Line Rd., Babylon, N. Y.
WEBB, Charles J., Box 2501, 3522 Polk St., Houston, Tex.
WEBB, Frederick T., 321 Commercial St., Braintree, Mass.
WEBB, Harry R., 5644 N. 5th St., Arlington, Va.
WEBB, James P., 4842-B S. 28th St., Arlington, Va.
WEBB, John A., P.O. Box 220, Warrensburg, Mo.
WEBB, Wilbert C., Norfolk District, Corps of Engrs., P.O. Box 119, Norfolk, Va.
WEBER, Donald O., 492 Bay St., St. Paul 2, Minn.
WEBER, Joseph C., P.O. Box 841, Lakeville, N. Y.
WEBSTER, Edgar E., III, 130 E. Liberty Dr., Wheaton, Ill.
WEBSTER, Joseph S., P.O. Box 227, Rockville Centre, L. I., N. Y.
WECKERLE, Charles H., Nassau County Plan. Comm., 107 Mineola Blvd., Mineola, N. Y.
WEEDEN, Harmer A., Prof., Bucknell Univ., Lewisburg, Pa.
WEEKS, John C., P.O. Box 602, Fallbrook, Calif.
WEHMEIER, Ray E., USGS, Box 133, Rolla, Mo.
WEIL, Dr. Alfredo, Apartado 1684, Caracas, Venezuela
WEIR, Virginia A. L., 465 Oakwood St., S.E., Washington 20, D. C.
WEISHAPPLE, Charles E., USGS, Box 133, Rolla, Mo.
WEISLOGEL, Charles L., 23 S. Garwood St., Fairview, Pa.
WEISS, Carlyle, Northwest Mapping Service, 655 E. 45th St., Seattle 5, Wash.
WEISSENSTEIN, Henry G., 3452 Dolfield Ave., Baltimore 15, Md.
WELBORN, Marshall, 1223 W. Grey, #2, Houston 19, Tex.
WELCH, Frederic W., 311 Campus Ave., Pullman, Wash.
WELDEN, J. Blynn, 3915 Massachusetts Ave., N.W., Washington 16, D. C.
WELLS, Jesse W., Setauket, N. Y.
WENDT, W. B., Prof., Speed Scientific School, Univ. of Louisville, Louisville, Ky.
WEST, Edward G., Allaben, N. Y.
WEST, George Richard, 3218 Scioto Trail, Portsmouth, Ohio
WEST, Harry L., The Texas Pipeline Co., Rm. 701, C & I Bldg., Houston, Tex.
WEST, Richard C., 1665 N. Chevrolet Ave., Flint 4, Mich.
WEST, Theodore W., 840 S. 21st St., Salem, Oreg.
WESTBROOK, V. C., County Surveyor, Smithdale, Miss.
WESTBROOKS, William L., 1126 Deckner Ave., S.W., Atlanta, Ga.

WESTERFELD, Wendell S., c/o Humble Oil & Refining Co., Box 1600, Midland, Tex.
WESTINGHOUSE, George F., USGS, 1109 N. Highland St., Arlington, Va.
WHALEY, Frank L., USGS, Box 133, Rolla, Mo.
WHARTON, George E., USGS, 1109 N. Highland St., Arlington, Va.
WHELAN, Lt. Comdr. Daniel E., Jr., 1167 Fiske St., Pacific Palisades, Calif.
WHELAN, William F., 3740 W St., N.W., Washington 7, D. C.
WHIPP, Wilton Smith, 3214 W. Broadway, Hopewell, Va.
WHIPPLE, John A., Route #1, Box 30-A, Arcata, Calif.
WHITAKER, R. L., Seismograph Service Corp., P.O. Box 1590, Tulsa, Okla.
WHITAKER, Richard E., 35 Fort Dr., Alexandria, Va.
WHITCOMB, G. E., 336 Tangent St., Lebanon, Oreg.
WHITE, Henry R., R.F.D. #4, West Chester, Pa.
WHITE, Leon V., Prof., Dept. Civil Engineering, Kansas State College, 1832 Anderson Ave., Manhattan, Kans.
WHITE, William A., 5505 8th Ave., Sacramento, Calif.
WHITLOCK, James D., Shell Oil Co., Box 2099, Houston, Tex.
WHITMORE, George D., USGS, Washington 25, D. C.
WHITTEMORE, Ray, USGS, 1109 N. Highland St., Arlington, Va.
WHITTEN, Charles A., USC&GS, Washington 25, D. C.
WICKHAM, W. W., 1015 N. Hamilton Blvd., Pomona, Calif.
WIGGLESWORTH, John R., Surveys Division, Court House Bldg., Arlington, Va.
WIGHT, Raulin B., 1008 Curtiss St., Downers Grove, Ill.
WILDMAN, Conrad M., Still, Wildman & Crockett, P.O. Box 2362, Houston 1, Tex.
WILHELM, Richard, 53 N. Grand Ave., Baldwin, N. Y.
WILKE, Harold A., 811 W. Parkview, St. Paul 3, Minn.
WILKINSON, Ernest C., 1400 Pine St., Rolla, Mo.
WILKINSON, Phil T., P.O. Box 3092, Houston, Tex.
WILKINSON, Robert M., Denver Federal Center, Denver, Colo.
WILKINSON, W. H., Crosby Lumber & Mfg. Co., Crosby, Miss.
WILLARD, Alan K., 1 Kirk St., Nashua, N. H.
WILLETT, Charles K., 317 N. Galena Ave., Dixon, Ill.
WILLIAMS, Charles A., 13 Clarence St., Wharton, N. J.
WILLIAMS, Franklin G., 5514 Nevada Ave., N.W., Washington 15, D. C.
WILLIAMS, George C., Western Gulf Oil Co., 1843 W. 47th St., Los Angeles 37, Calif.
WILLIAMS, Harold, USGS, Washington 25, D. C.
WILLIAMS, Harold Fish, P.O. Box 1190, Madison 1, Wis.
WILLIAMS, Howard, USGS, 1109 N. Highland St., Arlington, Va.
WILLIAMS, James A., 762 E. Main St., Nacogdoches, Tex.
WILLIAMS, James J., USGS, Box 133, Rolla, Mo.
WILLIAMS, John R., 1225 19th St., N.W., Washington 6, D. C.
WILLIAMS, Joseph D., 99 W. Main St., New Britain, Conn.
WILLIAMS, LeRoy E., USGS, Box 133, Rolla, Mo.
WILLIAMS, Millard R., 6222 Alviso Ave., Los Angeles 43, Calif.
WILLIAMS, Tom P., Jr., Bowman, Williams & Williams, 840 Front St., Santa Cruz, Calif.
WILLIAMS, Vern S., 13048 N.E. Halsey St., Portland, Oreg.
WILLIAMS, W. B., County Surveyor, Court House, Grand Rapids 2, Mich.
WILLIAMS, W. J., Box 1272, Plainview, Tex.
WILLIAMS, Weir D., 2005 Pass-a-Grille Way, P.O. Box 262, Pass-a-Grille Beach, Fla.
WILLIAMSON, Robert E., 42 Great Oaks St., Rolla, Mo.
WILLIFORD, Charles T., 4825 Reservoir Rd., N.W., Washington 7, D. C.
WILLS, George A., R. 2, Box 135-F, Laurel, Md.
WILSON, Mrs. Dell McC., Bur. of Public Roads, General Services Bldg., Washington 25, D. C.
WILSON, Joseph K., USC&GS, Howel, Ky.
WILSON, Lawrence E., 5016 Parkway, Fairfield, Ala.
WILSON, M. Allan, Delaware State Highway Dept., Dover, Del.
WILSON, Raymond P., 46 Paterson St., New Brunswick, N. J.
WILSON, Robert F., 122 W. St. James St., Tarboro, N. C.
WILSON, Ronald M., 6920 Fairfax Rd., Bethesda 14, Md.
WILSON, Thomas C., 606 E. 14th St., Casper, Wyo.
WILSON, W. H., Rm. 831-A, Humble Bldg., Houston 2, Tex.
WINCHESTER, Thomas H., Jr., 611 Bankers Ins. Bldg., Macon, Ga.
WING, Robert L., Div. of Water Resources, 401 Public Works Bldg., Sacramento 5, Calif.
WINIARSKI, Kasmiers J., 1435 N St., N.W., Apt. 301, Washington 5, D. C.
WINN, Bufard, 746 Elysian Field Rd., Nashville 4, Tenn.
WINSTON, Irvin H., 4210 Wawona St., Los Angeles 65, Calif.
WIRTH, Carl E., 227 Jackson St., P.O. Box 22, Hempstead, N. Y.
WISEMAN, Paul W., Houston Pipe Line Co., Box 2412, Houston 1, Tex.
WITKEGE, Francis L., USGS, Washington 25, D. C.
WITTMANN, Charles R., 902 Chalfonte Dr., Alexandria, Va.
WOLF, Gustave W., U. S. Navy Hydrographic Office, Washington 25, D. C.
WOLF, Whitney W., 132 W. Kaley Ave., Orlando, Fla.
WONG, Minos B., 58 Lynhurst Ave., Toronto 10, Ont., Canada
WOO, Harry W., R.F.D. 5, Box 333-X, Alexandria, Va.
WOOD, Helen Marsh, USGS, Washington 25, D. C.
WOOD, Herbert M., 77 Wood Ave., Roosevelt, N. Y.
WOOD, Lyle, Wood Drafting Service, Box 36, International Falls, Minn.
WOODBURY, Robert L., 52 Holmes St., Needham, Mass.
WOODLEY, Preston S., 1134 Jackson Rd., Florence, Ala.
WOODSIDE, Philip R., 34 Shadyside Ave., Summit, N. J.
WOODSON, H. L., Jr., 710 13th St., N.W., Washington, D. C.
WOODWARD, Louis A., 829 N. St. Marys St., San Antonio, Tex.
WOOLDRIDGE, Charles A., Jr., 1805 Nason St., Alameda, Calif.
WOPAT, Victor H., USGS, P.O. Box 346, Sacramento 2, Calif.
WRATHER, Dr. William E., 4710 Woodway Lane, Washington 16, D. C.
WRAY, James R., 5118 Hanna Pl., S.E., Washington 19, D. C.
WRIGHT, Dr. John K., American Geographical Society, Broadway at 156th St., New York, N. Y.
WRIGHT, Harry Otis, Jr., 3331 Reservoir Rd., N.W., Washington 7, D. C.
WRIGHT, Marshall S., Sr., 1308 Fort Hunt Rd., Alexandria, Va.
WRIGHT, Robert N., 7011 Corona Ave., Bell, Calif.
WUOPIO, Frans A., USGS, P.O. Box 346, Sacramento 2, Calif.

WYENER, Robert L., 3021 Parkway Terrace Dr., S.E., Washington 20, D. C.
WYNN, Tom M., Geophysical Services, Inc., Box 101, Miles City, Mont.

Y

YAMAGIWA, Ben T., USGS, P.O. Box 346, Sacramento 2, Calif.
YASAR, Sait, Prof., Chair of Topography & Geodesy, Technical University of Istanbul, Istanbul, Taksim, Turkey
YATES, Samuel, 3352 Chillum Rd., Mt. Rainier, Md.
YBARQUEN, Rufus, Box 1249, Houston 1, Tex.
YOAKUM, Benjamin H., 2520 Marconi Ave., Sacramento, Calif.
YOCUM, Webster, 725 N. Shamokin St., Shamokin, Pa.
YORK, Walter H., 5015 14th St., N.W., Washington 11, D. C.
YOSEF, Y. Ben, 15 Hissin St., Tel Aviv, Israel
YOUNG, A. L., Humble Oil & Refining Co., P.O. Box 2180, Houston, Tex.
YOUNG, Alden W., 624 Ostrander Ave., Riverhead, N. Y.
YOUNG, C. Addison, 10 Fiske Pl., Mount Vernon, N. Y.
YOUNG, Prof. Edward, 251 Orchard Hills Dr., R. 5, Ann Arbor, Mich.
YOUNG, George F., P.O. Box 683, St. Petersburg 1, Fla.
YOUNG, O. S., Angier, N. C.
YOUNG, Oliver E., Humble Oil & Refining Co., 1216 Main St., Houston 1, Tex.
YOUNIS, Magdi Ali, Military Survey Dept., Abassiah Barracks, Cairo, Egypt

Z

ZAHN, Frank H., 1410 N. Rhodes St., Arlington, Va.
ZAMECNIK, Frank J., The American Brass Co., 414 Meadow St., Waterbury, Conn.
ZELENKA, Anthony J., 2331 S. Lombard Ave., Cicero 50, Ill.
ZIEGLER, Rudolph K., R.D. #1, Bethel, Pa.
ZIEKE, George F., 1508 Fulton Court, Davenport, Iowa
ZIMMERLI, Arthur B., Jr., 11 Everett St., Kensington, Md.
ZINGERY, W. W. 828 Esperson Bldg., Houston, Tex.
ZOUNEK, Charles J., 1622 Q St., N.W., Washington 9, D. C.
ZUBER, Leo J., Metropolitan Planning Commission, 502 Title Bldg., Atlanta 3, Ga.
ZUKOWSKI, Victor T., 148 Gundry Dr., Falls Church, Va.
ZYDIK, John W., USGS, Denver Federal Center, Denver, Colo.

INSTITUTIONAL AND LIBRARY MEMBERSHIPS

COLLEGE AND UNIVERSITY

ALABAMA POLYTECHNIC INSTITUTE, Auburn, Ala.
ARIZONA, UNIVERSITY OF, Tucson, Ariz.
ARKANSAS, UNIVERSITY OF, Fayetteville, Ark.
ARTILLERY SCHOOL, THE, Fort Sill, Okla.
BAYLOR UNIVERSITY, Box 307, B. U. Station, Waco, Tex.
BROWN UNIVERSITY, Providence, R. I.
CALIFORNIA, UNIVERSITY OF, Berkeley 4, Calif.
CALIFORNIA, UNIVERSITY OF, Serials Dept., Berkeley 4, Calif.
CALIFORNIA, UNIVERSITY OF, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, N. Mex.
CALIFORNIA, UNIVERSITY OF, 405 Hilgard Ave., Los Angeles 24, Calif.
CARLETON COLLEGE, Northfield, Minn.
CASE INSTITUTE OF TECHNOLOGY, Cleveland 6, Ohio
CATHOLIC UNIVERSITY OF AMERICA, Mullen Library, Washington 17, D. C.
CHICAGO, UNIVERSITY OF, Chicago 37, Ill.
CINCINNATI, UNIVERSITY OF, Cincinnati 21, Ohio
CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, N. Y.
COLORADO, UNIVERSITY OF, Boulder, Colo.
COLUMBIA UNIVERVITY, New York, N. Y.
COOPER UNION, Cooper Square, New York 3, N. Y.
CORNELL UNIVERSITY, Ithaca, N. Y.
DARTMOUTH COLLEGE, Hanover, N. H.
FLORIDA STATE UNIVERSITY, East Campus, Tallahassee, Fla.
FLORIDA, UNIVERSITY OF, Gainesville, Fla.
GEORGIA INSTITUTE OF TECHNOLOGY, 225 North Ave., N.W., Atlanta, Ga.
ILLINOIS, UNIVERSITY OF, Urbana, Ill. (3 memberships)
ILLINOIS, UNIVERSITY OF, Chicago Undergraduate Division, Navy Pier, Chicago 1, Ill.
INDIANA, UNIVERSITY OF, Bloomington, Ind.
IOWA STATE COLLEGE, Ames, Iowa
IOWA, UNIVERSITY OF, Iowa City, Iowa
JOHNS HOPKINS UNIVERSITY, Baltimore 18, Md.
KANSAS STATE COLLEGE, Manhattan, Kans.
KANSAS, UNIVERSITY OF, Lawrence, Kans.
KENTUCKY, UNIVERSITY OF, Lexington 29, Ky.
LAFAYETTE COLLEGE, Easton, Pa.
LEHIGH UNIVERSITY, Bethlehem, Pa.
LOS ANGELES STATE COLLEGE, 855 N. Vermont Ave., Los Angeles 27, Calif.
LOUISIANA STATE UNIVERSITY, Baton Rouge 3, La.
MICHIGAN COLLEGE OF MINING AND TECHNOLOGY, Houghton, Mich.
MICHIGAN STATE COLLEGE, East Lansing, Mich.
MICHIGAN, UNIVERSITY OF, Ann Arbor, Mich.
MINNESOTA, UNIVERSITY OF, Minneapolis, Minn.
MISSOURI, UNIVERSITY OF, Columbia, Mo. (2 memberships)
MISSOURI, UNIVERSITY OF, School of Mines and Metallurgy, Rolla, Mo.
NATIONAL TSING HUA UNIVERSITY, c/o China Institute in America, Inc., 125 E. 65th St., New York 21, N. Y.
NEBRASKA, UNIVERSITY OF, Lincoln 8, Nebr.
NEW HAMPSHIRE, UNIVERSITY OF, Hamilton Smith Library, Durham, N. H.
NEW MEXICO, UNIVERSITY OF, Albuquerque, N. Mex.
NORTHWESTERN UNIVERSITY, Charles Deering Library, Evanston, Ill.
NOTRE DAME, UNIVERSITY OF, Notre Dame, Ind.
OHIO STATE UNIVERSITY, Columbus 10, Ohio
OHIO UNIVERSITY, Athens, Ohio
OKLAHOMA A. AND M. COLLEGE, Stillwater, Okla.
OKLAHOMA, UNIVERSITY OF, Norman, Okla.
OREGON STATE COLLEGE, Corvallis, Oreg.
PASADENA CITY COLLEGE, 1570 E. Colorado St., Pasadena 4, Calif.
PENNSYLVANIA STATE COLLEGE, Mineral Industries Library, State College, Pa.
PRINCETON UNIVERSITY, Princeton, N. J.
PUERTO RICO, UNIVERSITY OF, College of Agriculture and Mechanical Arts, Mayaguez, Puerto Rico

PURDUE UNIVERSITY, Engineering Exp. Station, Indiana State Hwy., Lafayette, Ind.
PURDUE UNIVERSITY, Lafayette, Ind.
RUTGERS UNIVERSITY, New Brunswick, N. J.
SOUTHERN METHODIST UNIVERSITY, Fondren Library, Dallas, Tex.
STANFORD UNIVERSITY, Stanford University, Calif.
SYRACUSE UNIVERSITY, Syracuse, N. Y.
TAS, AA & GM Br., Fort Bliss, Tex.
TENNESSEE, UNIVERSITY OF, Knoxville 16, Tenn.
TEXAS, A. AND M. COLLEGE OF, College Station, Tex.
TEXAS COLLEGE OF ARTS AND INDUSTRIES, Kingsville, Tex.
TEXAS, UNIVERSITY OF, Austin, Tex.
U. S. MILITARY ACADEMY, West Point, N. Y. (2 memberships)
UTAH STATE AGRICULTURAL COLLEGE, Logan, Utah
VIRGINIA MILITARY INSTITUTE, Box 755, Lexington, Va.
VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg 10, Va.
VIRGINIA POLYTECHNIC INSTITUTE, Engineering Extension, Danville Branch, Danville, Va.
VIRGINIA, UNIVERSITY OF, Alderman Library, Charlottesville, Va.
WASHINGTON UNIVERSITY, Skinker and Forsythe, St. Louis 5, Mo.
WEST VIRGINIA UNIVERSITY, Morgantown, W. Va.
WISCONSIN, UNIVERSITY OF, Madison 6, Wis.
YALE UNIVERSITY, New Haven, Conn.

FEDERAL

AERONAUTICAL CHART & INFORMATION SERVICE, 514 11th St., N.W., Washington 25, D. C.
AGRICULTURE DEPARTMENT, Atlanta Branch, 920 Glenn Bldg., Atlanta 3, Ga.
AGRICULTURE DEPARTMENT, Lincoln Branch, Rudge-Guenzel Bldg., Lincoln 1, Nebr.
AGRICULTURE DEPARTMENT, Philadelphia Branch, Bankers Securities Bldg., Philadelphia 7, Pa.
AGRICULTURE DEPARTMENT, Washington 25, D. C.
ARMY MAP SERVICE, 6500 Brooks Lane, Washington 16, D. C.
BEACH EROSION BOARD, Corps of Engineers, 5201 Little Falls Rd., N.W., Washington 16, D. C.
CENTRAL INTELLIGENCE AGENCY, 2430 E St., N.W., Washington 25, D. C. (5 memberships)
CIVIL INFORMATION & EDUCATION SECTION, GHQ, SCAP, APO 500, c/o Postmaster, San Francisco, Calif.
COAST & GEODETIC SURVEY (32 memberships)
Field Offices: Atlanta, Ga.; Baltimore, Md.; Boston, Mass.; Chicago, Ill.; Fort Worth, Tex.; Honolulu, T. H.; Kansas City, Mo.; Los Angeles, Calif.; New Orleans, La.; New York, N. Y.; Norfolk, Va.; Portland, Oreg. (2); San Francisco, Calif.; Seattle, Wash.; Tampa, Fla.
Surveying Ships: Bowen, Bowie, Cowie, Explorer, Gilbert, Hilgard, Hodgson, Hydrographer, Lester Jones, Parker, Pathfinder, Patton, Pioneer, Sosbee, Stirni, Surveyor
COAST GUARD, 1300 E St., N.W., Washington 25, D. C.
1st COMPUTATION TECH. SQDN., APO 845, c/o Postmaster, New York, N. Y.
CORPS OF ENGINEERS, 19 E. Poplar St., Walla Walla, Wash.
CORPS OF ENGINEERS, Albuquerque District, P. O. Box 1538 Albuquerque, N. Mex.
CORPS OF ENGINEERS, Chief of Engineers, Bldg. T-7, Gravelly Point, Washington 25, D. C.
CORPS OF ENGINEERS, Engineer School, Bldg. 270, Fort Belvoir, Va.
CORPS OF ENGINEERS, Ohio River Division, P.O. Box 1159, Cincinnati 1, Ohio
CORPS OF ENGINEERS, Portland District, 610 Pittock Block, Portland 5, Oreg.
CORPS OF ENGINEERS, Vicksburg District, P.O. Box 60, Vicksburg, Miss.
DIVISION OF GEOGRAPHY, Interior Dept., Washington 25, D. C.
ENGINEER, General Headquarters, Far East Command, APO 500, M/F: EVIL–P–ENGIV–CH–470, c/o Postmaster, San Francisco, Calif.
GEOLOGICAL SURVEY, Washington 25, D. C.
GEOLOGICAL SURVEY, Denver Federal Center, Denver 14, Colo.
HYDROGRAPHIC OFFICE, U. S. Navy Dept., Washington 25, D. C.
INTER–AMERICAN GEODETIC SURVEY, U. S. Army Caribbean, Box 2031, Balboa Heights, Canal Zone
LAKE SURVEY, 627 Federal Bldg., Detroit 26, Mich.
LIBRARY OF CONGRESS, Accessions Division, Washington 25, D. C.
LIBRARY OF CONGRESS, Order Division, Washington 25, D. C.
MARINE CORPS, Navy Dept., Washington 25, D. C.
MISSISSIPPI RIVER COMMISSION, Corps of Engineers, Vicksburg, Miss.
NAVAL AIR STATION, Public Works Officer, NABTC, Rm. 319, Bldg. No. 45, Pensacola, Fla.
NAVAL PHOTOGRAPHIC INTERPRETATION CENTER, Library, Bldg. T-21, Receiving Station, Washington 25, D. C.
PUBLIC ROADS, BUREAU OF, G.S.A. Bldg., Washington 25, D. C.
PUBLIC WORKS DEPARTMENT, Government of the Virgin Islands, St. Thomas, Virgin Islands
RECLAMATION, BUREAU OF, P.O. Box 1609 (RV-908-59), Amarillo, Tex.
STATE DEPARTMENT, OCD, Map Intelligence, Map Library Branch, Washington Auditorium, Washington 25, D. C.
USS MAURY, Commanding Officer, c/o Fleet Post Office, New York, N. Y.
USS REHOBOTH, Commanding Officer, c/o Fleet Post Office, New York, N. Y.
USS SAN PABLO, Commanding Officer, c/o Fleet Post Office, New York, N. Y.
USS TANNER, Commanding Officer, c/o Fleet Post Office, New York, N. Y.

STATE AND COUNTY

ALABAMA GEOLOGICAL SURVEY, State Geologist, University, Ala.
CALIFORNIA ACADEMY OF SCIENCE, Golden Gate Park, San Francisco 18, Calif.
CALIFORNIA, STATE OF, Dept. of Natl. Resources, Division of Mines, Ferry Bldg., San Francisco 11, Calif.
CALIFORNIA, STATE OF, Division of Water Resources, 401 Public Works Bldg., Sacramento, Calif.
CALIFORNIA STATE LIBRARY, Library and Court Bldg., Sacramento 9, Calif.
CONNECTICUT STATE PARK & FOREST COMMISSION, 165 Capitol Ave., Hartford 15, Conn.
FLORIDA STATE IMPROVEMENT COMMISSION, P.O. Box 930, Tallahassee, Fla.
MINNESOTA STATE HIGHWAY PLANNING SURVEY, 1094 University Ave., St. Paul 4, Minn.
NEVADA DEPARTMENT OF HIGHWAYS, Public Roads Administration, Carson City, Nev.

NEW YORK, STATE OF, Dept. of Commerce, 112 State St., Rm. 301, Albany, N. Y.

OHIO DEPARTMENT OF HIGHWAYS, Aerial Survey Section, 868 W. Goodale St., Columbus, Ohio

OREGON FOREST APPRAISAL DEPARTMENT, Douglas County, Roseburg, Oreg.

PENNSYLVANIA, COMMONWEALTH OF, Dept. of Internal Affairs, Harrisburg, Pa.

PENNSYLVANIA STATE PLANNING BOARD, Rm. 129, Capitol, Harrisburg, Pa.

PUERTO RICO, Division of Survey & Design, Roads and Bridges, San Juan, Puerto Rico

TEXAS STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS, 308 West 15th St., 400 Bolm Bldg., Austin 1, Tex.

VIRGINIA STATE PLANNING BOARD, Div. of Planning & Economic Development, 301 State Finance Bldg., Richmond, Va.

CITY

CHICAGO, The John Crerar Library, Technology Dept., 86 E. Randolph St., Chicago 1, Ill.

CLEVELAND PUBLIC LIBRARY, Serials Dept., 325 Superior Ave., Cleveland 14, Ohio

DENVER PUBLIC LIBRARY, Science & Engineering Dept., Denver, Colo.

DETROIT PUBLIC LIBRARY, Book Receiving, 5201 Woodward Ave., Detroit 2, Mich.

LOS ANGELES PUBLIC LIBRARY, 630 W. Fifth St., Los Angeles 13, Calif.

MILWAUKEE PUBLIC LIBRARY, Serials Section, 800 N. 8th St., Milwaukee 3, Wis.

NEW YORK PUBLIC LIBRARY, THE, Fifth Ave. & 42nd St., New York 18, N. Y.

PRIVATE

AERO SERVICE CORPORATION, 236 E. Courtland St., Philadelphia, Pa.

AMERICAN SHORE AND BEACH PRESERVATION ASSOCIATION, 1060 Broad St., Newark 2, N. J.

AMERICAN SOCIETY OF PHOTOGRAMMETRY, P.O. Box 18, Benjamin Franklin Station, Washington 4, D. C.

CALIFORNIA COMPANY, THE, P.O. Box 780, Denver, Colo.

CALIFORNIA COMPANY, THE, 800 The California Co. Bldg., New Orleans 12, La.

ENCYCLOPAEDIA BRITANNICA, INC., Cartography-1122, 20 N. Wacker Dr., Chicago 6, Ill.

FOREIGN & INTERNATIONAL BOOK COMPANY, INC., 110 E. 42nd St., New York 17, N. Y.

H. M. GOUSHA COMPANY, THE, 2001 The Alameda San Jose, Calif.

HENRY WILD SURVEYING INSTRUMENTS SUPPLY COMPANY OF AMERICA, INC., 26 Court St., Brooklyn 2, N. Y.

HUNT, Hal W., Editor, Engineering News Record, 330 W. 42nd St., New York 18, N. Y.

INTERNATIONAL ASSOCIATION OF BLUE PRINT & ALLIED INDUSTRIES, 506 S. Wabash Ave., Chicago 5, Ill.

INTER-STATE IRON COMPANY, Ishpeming, Mich.

MACMILLAN COMPANY, THE, 60 Fifth Ave., New York 11, N. Y.

NEW JERSEY ENGINEER, 86 E. State St., Trenton 8, N. J.

NORTH CAROLINA ENGINEER, P.O. Box 607, Raleigh, N. C.

SOUTHERN CALIFORNIA EDISON COMPANY, Edison Bldg., Los Angeles 53, Calif.

STANDARD OIL COMPANY OF CALIFORNIA, 225 Bush St., San Francisco 20, Calif.

FOREIGN AND INTERNATIONAL

Argentina

DIRECTOR, MINAS Y GEOLOGIA, Calle Peru 562, Buenos Aires

SOCIEDAD CIENTIFICA ARGENTINA, Av. Santa Fe 1145, Buenos Aires

Australia

HYDRO-ELECTRIC COMMISSION, Box 631-B, GPO, Hobart, Tasmania

INSTITUTION OF SURVEYORS, Science House, Gloucester & Essex Sts., Sydney, N. S. W.

STATE ELECTRICITY COMMISSION, 22/32 William St., Melbourne, Victoria

Brazil

INSTITUTO GEOGRAFICO E GEOLOGICO, Rua Antonio de Godoi 122, Sao Paulo

SERVICO GEOGRAFICO DO EXERCITO, Ministerio da Guerra, Rio de Janeiro

Canada

ALBERTA LAND SURVEYORS ASSOCIATION, Parliament Bldgs., Edmonton, Alberta

ARMY SURVEY ESTABLISHMENT, RCE, Army Headquarters, Ottawa, Ont.

CANADIAN INSTITUTE OF SURVEYING AND PHOTOGRAMMETRY, THE, 41 Grove Ave., Ottawa, Ont.

GEODETIC SURVEY OF CANADA, Surveys and Mapping Branch, Mines & Technical Surveys Dept., 980 Carling Ave., Ottawa, Ont.

GEOGRAPHIC BUREAU, Dept. of Mines & Resources, Ottawa, Ont.

GEOLOGICAL SURVEY OF CANADA, Victoria Memorial Museum Bldg., Ottawa, Ont.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO, 620 University Ave., Toronto 2, Ont.

INTERNATIONAL CIVIL AVIATION ORGANIZATION, Rm. 503, International Aviation Bldg., Montreal, P. Q.

J. I. B. DEFENSE RESEARCH BOARD, Rm. 4711, "A" Bldg., ND Hq., 125 Elgin St., Ottawa, Ont.

McGILL UNIVERSITY, Redpath Library, 3459 McTavish St., Montreal, P. Q.

ROYAL MILITARY COLLEGE, Kingston, Ont.

SURVEYS & MAPPING BUREAU, Dept. of Mines & Resources, Rm. C-353, #8 Tempo. Bldg., Carling Ave., Ottawa, Ont.

Colombia

TEXAS PETROLEUM COMPANY, Topographical Engrg. Dept., Apartado 159, Barranquilla

Cuba

COLEGIO MUNICIPAL DE AGRIMENSORES, Padre Valencia 55, Camaguey

Egypt

ANGLO-EGYPTIAN OILFIELDS, LTD., Shell House, P.O. Box 228, Cairo

England

COMMANDANT, MILITARY COLLEGE OF SCIENCE, Shrivenham, Wilts.

DIRECTOR GENERAL, B. R. SECTION, Ordance Survey Office, Chessington, Surrey (7 memberships)

EMPIRE SURVEY REVIEW, Innisfree, Angmering-on-Sea, Sussex
HYDROGRAPHER, ADMIRALTY, Oxgate Lane, Cricklewood, London, N.W.2
KING'S COLLEGE, Durham Univ., Newcastle-upon-Tyne, 1
OXFORD UNIVERSITY, Bodleian Library
ROYAL GEOGRAPHICAL SOCIETY, Kensington Gore, London, S.W.7
THE UNIVERSITY, Liverpool
WAR OFFICE LIBRARY, Whitehall, London, S.W.1

Finland

MAANMITAUS, Soc. Surveying Sciences, Kirkkokatu 3, Helsinki
MERENKULKAHALLITUKSEN ME IKARTTAOSASTO, Voorimiehenkatu 1, Helsinki

France

INSTITUT GEOGRAPHIQUE NATIONAL, 35 Bd. des Invalides, Paris
INTERNATIONAL ASSOCIATION OF GEODESY, 19 Rue Auber, Paris
JOURNAL DES GEOMETRES EXPERTS ET TOPOGRAPHES FRANCAIS, 9 Avenue Foch, Vincennes
SERVICE HYDROGRAPHIQUE DE LA MARINE, 13 Rue de l'Universite, Paris

Germany

INSTITUT FUR ANGEWANDTE GEODASIE, Land Survey Office, Friedberger Landstrake 325, (16) Frankfurt A.M.

Holland

TECHNISCHE GLOGESCHOOL AFD CGEODESIE, Kanaalweg 4, Delft
VER. VAN CIVIEL-LANDMETERS EN GEOD. ENGENIEURS, Kanaalweg 4, Delft

Hong Kong

DIRECTOR OF PUBLIC WORKS

India

CHIEF, GENERAL STAFF, S.D. 1, Army Headquarters, New Delhi
HEADQUARTERS, SOUTHERN COMMAND, Poona
SCHOOL OF MILITARY ENGINEERING, Harris Bridge, West Kirkee, Poona 3

Indonesia

N. V. DEBATAAFSCHE PET. MIJ., Tarakan, East Coast, Borneo
N. V. DEBATAAFSCHE PET. MIJ., Pladjoe, Sumatra

Israel

MINISTRY OF AGRICULTURE, Gov't. of Israel, Hakiryia
SURVEY DEPARTMENT, P.O. Box 2730, Tel-Aviv

Italy

INSTITUTO GEOFISICO GEODETICO, Dell Universita, Via Balbi, 5, Genoa

Kenya

DIRECTOR OF SURVEYS, P.O. Box 1766, Nairobi

Malaya

OFFICE, SURVEYOR GENERAL, Federation of Malaya and Singapore, Kuala Lumpur (2 memberships)

Mexico

INSTITUTO PANAMERICANO DE GEOGRAFIA E HISTORIA, Av. Observatorio 192, Tacubaya, D. F.
SOC. MEXICANA DE GEOGRAFIA Y ESTADISTICA, Justo Sierra num. 19, Apartado Post. 10739, Mexico City, D. F.

New Zealand

NEW ZEALAND INSTITUTE OF SURVEYORS, G.P.O. Box 831, Wellington
OTAGO UNIVERSITY, Dunedin

Norway

NORGES GEOGRAFISKE OPPMALING, St. Olavsgt. 32, Oslo

Pakistan

MINISTRY OF DEFENCE, P. F. & S. Section, Rawalpindi (2 memberships)

Peru

INSTITUTO GEOGRAFICO MILITAR, Ejercito del Peru, Avenida Arequipa No. 310, Aptdo. 2038, Lima
SOCIEDAD GEOGRAFICA DE LIMA, Aptdo. 1176, Lima

Spain

INSTITUTO GEOGRAFICO Y CATASTRAL, Calle de Ibanez de Ibero, 3, Madrid
UNION NACIONAL DE ASTRONOMIA Y CIENCIAS AFINES, Serrano, 117-Madrid

Sweden

ING. FIRMAN KJESSLER & MANNERSTRAL AB, Kaptensgatan 6, Stockholm
K. TEKNISKA HOGSKOLANS BIBLIOTEK, Stockholm 26
RIKETS ALLMANNA KARTVERK, Stockholm 8

Switzerland

GEODATISCHES INSTITUT, Eidg. Techn. Hochschule, Zurich
HENRY WILD SURVEYING INSTRUMENTS SUPPLY COMPANY, LTD., Heerbrugg

Trieste

INSTITUTO DI TOPOGRAPHIC, Geodesia Universita

Turkey

DOGAN-YURUK TECIM EVI, Ragip Erensoy, Sogut Str. Latif Han No. 3-5, Istanbul-Galata

Uruguay

UNIVERSIDAD DE LA REPUBLICA, Instituto Nacional de Investigaciones Geograficas, Casibla de Correo 450, Montevideo

USSR

BIBLIOTEKA, Frunze, 19, Moscow
BIBLIOTEKA AKADEMI, Nauk SSSR, Birgevaia linia, 1, Leningrad 164
GEODEZI I KARTOGRAFI, Bolotnaja 12, Moscow
GOS. NAUCHN. BIBLIOTEKA, Minist. vyssh. obraz., pl. Nogina, 2/5, Moscow
KNIZHNY OTD. AKAD. NAUK., Ul. Kropotkina 16, Moscow 34
PUBLICHNAJA BIBLIOTEKA, Sadovaja ul., 18, Leningrad

GEOGRAPHIC DISTRIBUTION OF MEMBERS

UNITED STATES AND POSSESSIONS

ALABAMA—20

Anniston
Pippin, R. P.
Birmingham
Dudley, E. E.
Harris, W. H.
Kuzmicki, F. D.
Fairfield
Wilson, L. E.
Florence
Woodley, P. S.
Ft. Payne
Ladd, E. J.
Geneva
Miller, G. E., Jr.
Hartselle
Pattillo, L. C.
Maxwell AF Base
Johnson, W. E.
Mobile
Luquire, J. W., Jr.
Norden, H. S.
Montgomery
Folmar, J. M.
Selma
Crisman, L. R.
Sheffield
Crockett, V. P.
Talladega
Bain, J. R.
Tallassee
Sizemore, W. R.
University
Conant, L. C.
Wylam
Estock, J. K., Jr.
Kuzmicki, R. T.

ALASKA—8

Fairbanks
Hazard, T. A.
Homer
Abbott, C. B.
Juneau
Golub, H.
Hyde, O. R.
Slone, A.
Palmer
Jennings, D. J.
Valdez
Sihler, O. F.
Whittier
Nelson, R. G.

ARIZONA—3

Clifton
Mann, R. E.
Kingman
Housholder, E. R.
Tucson
Newlin, P. B.

ARKANSAS—10

Crossett
Abbott, J. H.
Clark, E. W.
Farque, C. W.
Hampton
Lyon, R. N., Jr.
Herber Springs
Stanfield, E. T.
Little Rock
Arnold, C. H.
Buxton, J. E.
Paragould
Brawner, W. M.
Sheridan
Spray, W. S.
Texarkana
McIver, H. M.

CALIFORNIA—321

Alameda
Wooldridge, C. A., Jr.
Alhambra
Holland, E. W.
Miller, C. C.
Alladena
Lefkowitz, H. I.
Alturas
Haselwood, R. W.
Arcata
Whipple, J. A.
Auburn
Andregg, J. N.
Bakersfield
Dumble, C. S.
O'Keefe, M. S., Jr.
Parr, C. L.
Rookus, H. E.
Seely, F.
Stockbridge, G. H.
Suverkrop, L.
Wagers, F. E.
Bell
Wright, R. N.
Berkeley
Davis, R. E.
Foote, F. S.
Moffitt, F. H.
Beverly Hills
Gabel, W. H.
Bloomington
Lyman, E. W.
Burbank
Calahan, P. H.
Hamner, D. S.
Burlingame
Delaney, A. E.
Carmel
Bestor, G. C.
Otter, J. D.
Carmichael
Grimm, W. W.
Chico
Gravelle, W. G.
Del Paso Heights
Tibey, E. A.
Downey
Johnson, J. E.
Kulp, R. F.
Downieville
Snyder, D. S.
Elverta
Hendrickson, M. C.
Marshall, L. F.
Escondido
Sisson, L. R.
Eureka
Brizard, A.
Leatherwood, G. M.
Fairfield
Grimm, K. B., Jr.
Fair Oaks
Praught, C. H.
Fallbrook
Weeks, J. C.
Fresno
Lang, H. J.
Gilroy
Hanna, W. J., Jr.
Glamis
Hinely, J. A.
Glendale
Smith, W. A.
Wattles, W. C.
Grass Valley
McGuire, C. T.
Greenville
Scruggs, M. O.
Hawthorne
Compagnon, H.
Hollywood
Elsenman, F. T., Jr.
Pafford, F. W.
Independence
Brierly, A. A.
Isleton
Beinhauer, W.
Klamath
Sheppard, J. L.
La Canada
Smith, W. P.
Lafayette
Burton, S. G.
Laguna Beach
Keerl, W. I.
La Mesa
Powell, G. S.
Lodi
Gatzert, C.
Long Beach
Hillman, E. A.
Tygret, J. M.
Los Angeles
Anderson, J. H.
Asher, J. E.
Badgley, B. O.
Bailey, F.
Barsugli, A. J.
Bower, W. M.
Chapin, E. L., Jr.
Condra, R. J.
Cook, C. W.
Dougall, M.
Dorsey, J. E.
Earle, T. R.
Eliel, L. T.
Fair, W. H., Jr.
Goetze, K. F.
Greenwald, G. A.
Hammond, L. S.
Horne, R. D.
Huey, R. B.
Johnson, A. C.
Kibbe, M. H.
Klain, J.
Lane, G. S.
Larsen, H. R.
Lindenfeld, J. A.
MacFadden, C. H.
Marsh, D.
Mills, N.
Mundhenk, G.
Murakami, S. T.
Newville, J. R.
Odle, J. R.
Peterson, H. F.
Polley, E. R.
Robertson, C. D.
Roth, P. E.
Schmahl, E. L.
Sheppard, W. E.
Silverman, J.
Sloan, I. I.
Smirnoff, M. V.
Stassi, T.
Terpening, F. D.
Thompson, H. L.
Vaughan, E.
Williams, G. C.
Williams, M. R.
Winston, I. H.
Lower Lake
O'Conner, T. L.
Marysville
Enfield, J.
Merced
Bedesen, W. E.
Modesto
Bulton, E. D.
McCoy, W. H.
Monterey
Graham, B. H.
Mountain View
McCarty, J. E.
Newark
Dutra, W. E.
North Hollywood
Ford, G. H.
Gann, I. T., Sr.
Saunders, R. N.
North Sacramento
Crouch, G. O.
Oakland
Croley, E. R.
Daily, W. T.
Hammon, A. C.
Ryker, H. C.
Schilling, H. A.
Soderlund, V. R.
Ojai
Bailey, D. G.
Pacific Palisades
Whelan, D. E., Jr.
Palo Alto
Fox, T., Jr.
Nolte, G. S.
Palos Verdes Estates
Burke, F. M.
Pasadena
Darby, H. A.
Hanson, C. E.
Herr, C. R.
Hopkins, H. C.
Petaluma
Bond, F.
Placerville
Kent, E. J.
Pomona
Wickham, W. W.
Redding
Hill, C. A.
Sargent, L. J.
Reseda
Gutier, E. C.
Sacramento
Abbott, C. W. W.
Atherton, T. L.
Bartman, R. C., Jr.
Biever, C. A.
Blizzard, D. G.
Bridges, C. E.
Brown, W. R.
Bruce, R. H.
Buck, W. N.
Cameron, T. F.
Campbell, W. R.
Chan, H. C.
Chapman, W. H.
Church, J. P.
Collins, J. G.
Cooper, J. S., Jr.
Cooper, W. A.
Cox, S. R.
Cross, D. L.
Davis, J. Z.
Dean, D. H.
Dewey, R. C.
Dinnin, L. C.
Eckhardt, C. V.
Ecklund, C. A.
Eisenhardt, W. C.
Eldridge, W., Jr.
Erickson, P. C.
Farmer, J. L.
Farrell, W. H.
Farrington, E. G.
Fogg, P. L.
Fong, T. Y.
Fredricks, J. H.
Frenza, W. A.
Gardner, M. L.
Gardner, R. N.
Greenwood, C. O., Jr.
Gunby, R. A.
Gutierrez, O. J.
Halbrook, Q. X.
Hall, Harvey J.
Hall, Hugo J.
Hamilton, Mrs. B. A.
Hill, R. H.
Hodgeson, H. H.
Hogan, E. M.
Hoptry, R. A.
Hosokawa, K.
Jeffs, D. R.
Jensen, G. K.
Jordan, J.
Humrich, G. E.
Katibah, G. P.
Kaufmann, G. A.
Koltun, E. L.
Landers, W.
Larkins, M. G., Jr.
Letey, A. E.
Lewis, J. L.
Linn, G. G.
Long, J. T.
Lundberg, E. A.
MacKay, H. L.
Mansfield, L. B.
McConnell, H. J.
Milardovich, J. A.
Mitchell, J. S.

Monbeck, R. R.
Mortenson, C. N.
Muir, L. N., Jr.
Murphy, T. F.
Nelson, E. L.
Nelson, T. J.
Norgren, D. U.
O'Dea, J. C.
Ogden, I.
Palmer, H. B.
Perlenfein, A.
Peterson, L. K.
Pinkerton, D. L.
Platt, W. K.
Ploetz, A. L.
Randall, F. R.
Roberson, C. L.
Rowland, J. B.
Rutledge, D. H.
Sandlin, H. A.
Sax, K. W.
Schultz, A. D.
Schumaker, R. G.
Seward, V. S.
Smith, A. H.
Smith, K. R.
Spencer, G. H.
Stevenson, R. G.
Stewart, R. H.
Stinchfield, R. S.
Strang, C. R.
Tanner, W. S., Jr.
Teller, H. L., Jr.
Tennant, J. N.
Thomas, W. L.
Thornton, K.
Tibbs, D. D.
Toy, J. A.
Tracy, J. H.
Trevallee, G. A.
Tudor, S. T.
Van Camp, C. P.
Vaughan, D. F.
Vaughan, H.
Walker, W. L.
Watson, R. E.
White, W. A.
Wing, R. L.
Wopat, V. H.
Wuopio, F. A.
Yamagiwa, B. T.
Yoakum, B. H.

Salinas
Camp, R. S.

San Bernardino
Lintz, C. F.

San Diego
Daniels, A. W.
Gray, E. S.
Mack, J. H.
Moser, W. H.
Simonds, C. P.

San Francisco & c/o P.M.
Aggeler, C. J.
Angeloni, W. A.
Baker, C. A.
Ball, F. A.
Briggs, R.
Carr, G. P.
Degnan, L. V.
Gaeden, H. J.
Gordon, J. B.
Harvey, J. H.
Johnson, L. S.
Jones, E.
LaVan, R. E.
Lint, L. B.
Maness, L.
Sarlin, W. O.
Shepherd, R.
Sieker, R. W., Jr.
Taylor, J. O.
Waite, J. E.
Waterfall, H. A.

San Jose
Ruth, L. W., Jr.
Stohsner, E. E.
Verner, P. L.

San Leandro
Baptist, A. J.
Levy, S. F.

San Luis Obispo
Funk, L. L.

San Mateo
Wahlen, H. S.

San Rafael
Egolf, H. L., Jr.
Lockton, E.

Santa Ana
Wattles, G. H.

Santa Barbara
Fowler, J. G.
Grant, U. S.

Santa Cruz
Baldwin, A. M.
Smith, S. R.
Williams, T. P., Jr.

Sausalito
Jackson, C. D.

Shell Beach
Lamb, A. L.

Sonora
O'Hara, J. L.
Stirewalt, F. S.

Stanford University
McGirk, L. S., Jr.

Stockton
Angermeier, R.

Supulveda
Purvis, J. A.

Van Nuys
Batty, J. W.
Juras, G. B.
Nelson, W. T.
Saunders, H. R.

Vista
Ponton, S.

Warner Springs
Anderson, C.

West Sacramento
LeClair, L. G.

Woodland
Glover, N. O.
Roberts, J. H.

Yuba City
Von Geldern, E.

Canal Zone—5

Balboa Heights
Fassett, R. E.
Rabito, F. J.
Torbert, L. E.

Curundu
Kirchner, C. L.
Tewinkel, M. A.

Colorado—37

Colorado Springs
Bermel, P. F.
Grote, W. F.

Denver
Alexander, E. G.
Blake, P.
Collins, R. S.
Coon, E. J.
Cummins, T. V.
Davis, R. O.
Dyer, J. C.
Dyer, J. T.
Gervais, A., Jr.
Gregg, F. L.
Harmel, M. A.
Hendrickson, L. H.
Isto, R. E.
Jeppesen, E. B.
Johnson, P. H.
Kautz, W. A.
Labbe, C. A.
Langhofer, J. H.
McDermith, H.
McGivern, R. F.
McQuaid, D. J.
Moore, R. H.
Parker, H.
Prouty, W. L.
Schwartz, B. L.
Stevenson, L. M.
Tanner, J. J.
Upton, W. B., Jr.
Vidmar, A. L.
Warnock, Mrs. M. D.
Wilkinson, R. M.
Zydik, J. W.

Glenwood Springs
Walker, T.

Grand Junction
Platt, N. B.

Julesburg
Heidt, M.

Connecticut—44

Ansonia
Clarke, V. B.

Bridgeport
Fray, W. C.
Penny, F. C.
Roberts, R. B.

Canaan
Lambert, W. D.

Derby
Thompson, G. E.

East Hartford
Olshesky, J. J.

Fairfield
Hajas, E. S.

Glastonbury
Mozzochi, J. J.

Greenwich
Bond, F. C.

Hamden
Reynolds, W. A.

Hartford
Close, F. P.
McCurdy, W. R.
Moses, S.
Skilton, H. I.
Soehle, W. E.

Middletown
Cannon, S. C.

Milford
Allen, S. E.

New Britain
Fresen, E. C.
Williams, J. D.

New Haven
Beach, J. C.
Cahn, C. A.
Farnham, C. S.
Leighton, K. W.
Pulver, J. W.
Vreeland, R. P.

Newington
Holsten, W. L.

Norwalk
Howe, F. L., Jr.
Hubbell, C. C.

Norwich
Gray, E. J.

Riverside
D'Andrea, R. V.

Rockville
Chambers, R. H.

Salisbury
Knickerbocker, H.

Stamford
Gregory, H. W.
Parsons, H. A.

Stratford
Rowe, T. D.

Thompsonville
Savage, W. E., Jr.

Torrington
Hanson, G. A.
Nierintz, W. F.

Unionville
Hodge, M.

Wallingford
Boyce, R. I.

Waterbury
Trowbridge, F. J.
Zamecnik, F. J.

Watertown
Reynolds, E. J.

Delaware—5

Dover
Wilson, M. A.

Wilmington
Barkley, R. J.
Coverdale, M. E.
Price, F. S.

Wyoming
Haddaway, J. E.

District of Columbia—222

Washington
Abraham, N. N.
Adkinson, B. W.
Alpaugh, W. A.
Anderson, G. L.
Argyropais, L.
Aruta, M. R.
Bailey, G. D.
Barker, F. W.
Barnhart, J. H.
Bashore, Mrs. M. R.
Bay, H.
Bayles, C. M.
Bean, H. A.
Belgian Military & Air Attaché
Bell, G. A.
Belton, R. J.
Biggs, A. P.
Borden, F. S.
Boggs, S. W.
Braaten, N. F.
Brammell, J. A.
Braund, J. J.
Brelick, J.
Brooks, H. R.
Brown, E. B.
Brown, W. N.
Bruder, W. A.
Buckmaster, J. L.
Buettner, A. J.
Bumstead, N.
Carey, K. P.
Carpenter, J. C.
Carroll, J.
Clark, C. W.
Cohen, P. M.
Colbert, L. O.
Collier, S. E.
Cook, M. M.
Coombs, A. H.
Coutinho, J. de S.
Cowell, J. G.
Crump, W. C.
Davies, C. H.
Deardorf, K. R.
Deily, E. A.
Dingman, L. F.
Dix, W. S.
Dobbin, J. V.
Dofflemyer, C. E.
Doran, P. C.
Duerksen, J. A.
Edmonston, H. R.
Eller, R. C.
Engen, G. A.
Evans, R. T.
Eyman, R. P.
Fennell, E. J.
Fish, G. R.
Fitzgerald, J. R.
Flint, G. M., Jr.
Frew, R. L.
Fuechsel, C. F.
Fuller, H. C.
Garner, C. L.
George V. D.
Gerlach, A. C.
Godfrey, E. M.
Gossett, F. R.
Graham, C. R.
Greene, D. L.
Griffith, S. V.
Grimes, E. G.
Guthe, O. E.
Hardy, R. L.
Harrington, E. G.
Hart, F. M.
Havre, G.
Hellman, W. M.
Hemple, H. W.
Henderson, R. S., Jr.
Hoskinson, A. J.
Hough, F. W.
Hough, N. G., Sr.
Hoxie, B. W.
Jamieson, D. F.
Jeffers, K. B.
Jones, B. G.
Jones, D. A.
Jones, E. L.
Judson, L. V.
Kalbfleisch, A. C.
Karo, H. A.
Keegan, K. B.
Kelsh, H. T.
Kendall, A. W.
Kern, K. C.
Kilmartin, J. O.
Knox, R. W.
Ladd, J. G.
LeGear, Mrs. C. E.

Leifson, G.
Leue, C. F.
Lewis, J. M.
Linehan, U. J.
Littlepage, G. B., Jr.
Locraft, B. F.
Lofgren, P. F.
Lushene, J. P.
Lyddan, R. H.
Malnate, W. F.
Maltby, C. S.
Mangan, Mrs. G. A.
Mannar, B. W.
Marmer, H. A.
Mathisson, J. C.
McCarthy, E. R.
McGann, L. A.
Mills, D. L.
Miscoski, V. T.
Mock, G. A.
Moitoret, V. A.
Monday, F. E.
Moore, L. C.
Moore, R. S.
Moss, W. H.
Munthe-Kaas, O.
Nalls, J. W.
Natella, F.
Neal, J. M.
Nelson, O. H.
Newlin, D. B.
Noakes, A. H., Jr.
Nolan, T. B.
Norris, C.
Nowicki, A. L.
Ottinger, R. H., Jr.
Parkin, E. J.
Pates, J. R., Jr.
Penyapol, A.
Perri, M. T.
Powell, A. L.
Pumpelly, J. W.
Randall, R. H.
Randall, R. H., Jr.
Randall, W. E.
Rappleye, H. S.
Reading, O. S.
Reed, C. R.
Reed, T. B.
Richmond, A. E.
Ristow, W. W.
Risvold, O. S.
Rittenburg, I. E.
Roberts, E. B.
Roudabush, M. A.
Runyan, R. H.
Sanders, I. T.
Sangster, J. G.
Saucerman, Mrs. S. A.
Schanck, C. A.
Schmuhl, K.
Sears, W. B.
Senseney, H. S.
Serveson, E. H.
Shalowitz, A. L.
Shearer, N. E.
Shelton, C. A.
Sherman, S.
Shofnos, W.
Shortt, Q. R.
Simmons, H. E.
Simmons, L. G.
Smart, L. R.
Smith, P. A.
Sobieralski, V. R.
Sollins, A. D.
Speert, J. L.
Spies, H. R.
Staack, J. G.
Staley, J. J.
Stanley, A. A.
Starbuck, T. W.
Stevens, L. T.
Stiefel, A. C.
Straw, L. S.
Stroup, W. B. W.
Stuart, D. G.
Studds, R. F.
Sutcliffe, W. D.
Suvankes, X.
Swanson, L. W.
Sweet, A. J.
Thompson, M. M.
Thorson, A. C.
Thurston, R. F.
Treadwell, T. K., Jr.
Vogel, E. C.
Wakefield, E. J.
Wardwell, A. L.
Watkins, J. L.
Watson, D. H.
Weir, V. A. L.
Welden, J. B.
Whelan, W. F.
Whitmore, G. D.
Whitten, C. A.
Williams, F. G.
Williams, H.
Williams, J. R.
Williford, C. T.
Wilson, Mrs. D. McC.
Winiarski, K. J.
Witkege, F. L.
Wolf, G. W.
Wood, H. L.
Woodson, H. L., Jr.
Wrather, W. E.
Wray, J. R.
Wright, H. O., Jr.
Wyener, R. L.
York, W. H.
Zounek, C. J.

FLORIDA—52

Eglin Air Force Base
Ross, L. E., Jr.
Fernandina
Lovesee, G. W.
Ft. Lauderdale
Butler, J.
McLaughlin, J. W.
Gainesville
Bransford, T. L.
Hollywood
Berry, M. E.
Hypoluxo
Malone, F. J.
Jacksonville
Angas, R. M.
Bain, J. S.
Cogswell, A. R.
Coker, C. P.
DeGrove, R. H.
Gillespie, W. W.
Howard, J. F.
Mainey, L. H.
Privett, J. C.
Southworth, A. M.
Jasper
Riley, R. R.
Kissimmee
Butler, J.
Largo
Nunemacher, S. C.
Marathon
Goggin, J. P.
Lapham, P. B.
McIntosh, E. L.
Melbourne
Canova, C. F., Sr.
Greever, J. J.
Miami
Freedman, B. D.
Schwebke, H. C.
Miami Beach
Gordon, R.
Ocala
Krieg, C. O.
Lampp, E. R.
Moorhead, J. R., Jr.
Orlando
Clawson, E. M.
Wolf, W. W.
Pass-a-Grille Beach
Williams, W. D.
Pensacola
Comstock, R. D., Sr.
Cook, J. W.
St. Petersburg
Binyon, H. A.
Bose, J. C.
Earle, R. A.
Peacock, F. L.
Young, G. F.
Sarasota
Pavitt, R. W.
Sebring
Hawkins, J. W.
Stuart
Brock, J. E.
Tallahassee
Beazley, J. S.
Matthews, A. G.
Tampa
Kelley, T.
Rasure, W. A.
Tavares
Moorehead, T. O.
Titusville
Schuster, F. P.
Vero Beach
Carter, E. E.
West Palm Beach
Brockway, G. S.

GEORGIA—41

Athens
Barnes, J. A.
Hulme, J. C.
Atlanta
Black, R. P.
Bracewell, J. R., Sr.
Buck, R. W.
Bush, H. L.
Fitspatrick, H. V.
Grow, G. S.
Hooks, J. M.
Linder, T.
Lucas, J. H.
O'Brien, J. E.
Roberts, C. R.
Robison, H. O.
Silcox, E. S.
Smith, J. T., Jr.
Thomas, C. N.
Westbrooks, W. L.
Zuber, L. J.
Augusta
The M. W. Hall Co.
Columbus
Carr, G. V.
Crawfordville
Smith, C. H.
Decatur
Copley, J. W.
Donalsonville
Childree, L. L.
Dunwoody
Vinson, G. R.
Forest Park
Gibbon, L. P.
Gray
Smith, T. E.
Jefferson
Venable, A. L.
Leesburg
Crotwell, S. P.
Macon
McSwain, H. L.
Winchester, T. H., Jr.
Milledgeville
Rice, C. W.
Patterson
Porter, J. J.
Rome
Abbott, A.
Baskin, J. P.
Savannah
Garmany, H. M.
Knight, E. C.
Smyrna
Hensley, P.
Sylvania
Bell, R. L.
Winterville
Hawken, C. C.
Wrens
Andrews, E. G.

GUAM—1

Agana
Robinson, F. A.

HAWAIIAN ISLANDS—1

Honolulu
Towill, R. M.

IDAHO—2

Moscow
Sargent, C.
Pocatello
Hall, W. H.

ILLINOIS—78

Aurora
Berg, T. M.
Champaign
Anderson, E. M.
Keller, J. J.
Chicago
Bonnstetter, G. A.
Bullis, M. O.
Clausen, E. L.
Cunnea, J. P.
Faram, S. W.
Fuller, E. W.
Geuder, N. O.
Greengard, C. W.
Jandacek, G. W.
Kozak, A. F.
Marnul, J.
Monsen, M. T.
Nelson, E. E.
Nowicki, R. A.
Odell, C. B.
Pasquinelli, S.
Penn, J. C.
Price, E. E.
Robbins, W. J.
Schaeffer, M. B.
Schmitt, A. C.
Senechalle, L. J.
Shapiro, S. E.
Smith, E. M.
Van Meer, E.
Cicero
Zelenka, A. J.
Decatur
Burgener, H. J., Sr.
Elrod, L. E.
Morse, F. S.
Dixon
Willett, C. K.
Downers Grove
Wight, R. B.
Elgin
Joseph, M. M.
Elmhurst
Lindstrom, J. M.
Evanston
Espenshade, E. B., Jr.
Humphrey, C. B.
Galesburg
Pappmeier, L. S.
Granville
Bouxsein, I.
Grayville
Alldredge, K. B.
Gurnee
Dixon, G.
Harvey
Chlebicki, G. J.
Robinson, R. W.
Havana
Cordes, J. H.
La Grange
Verrill, G.
Moline
Boudinot, A. R.
Mt. Carmel
Fearheiley, R. P.
Mt. Prospect
Pathe, C.
Mt. Vernon
Phillips, W. M.
Northbrook
Tiddens, P. T.
Pekin
Bailey, A. D.
Peoria
Halvorson, A. R.
Horton, P. Z.
Wallace Engr. Co.
Rockford
Derr, C. W.
Holmquist, J. H.
Lundgren, A.
Moring, L. D.
Rock Island
Reese, W. J.
Shelbyville
Smith, R.
Springfield
Anderson, D. D.
Hoff, C. W.
McKibbin, J. C.
Pemberton, C.
Watson, W.

Urbana
Booth, A. W.
Dell, G. H.
Ekblaw, G. E.
Foster, F. W.
Kinch, M.
Rayner, W. H.
Schmidt, M. O.
Walker, L. D.
Wheaton
Steinbrecher, H. F.
Webster, E. E., III
Winnetka
Dietzgen, J. E.
Wood River
Nifong, F.

Indiana—21

Albion
Pyle, A. L.
Austin
Gardner, H. M.
Maggard, A.
Danville
Gossett, J. A.
Shartle, S. M.
Evansville
Goad, M.
Ft. Wayne
Smith, O. C., Jr.
Indianapolis
Glass, R. A.
Lafayette
Curtis, K. S.
La Porte
Alexander, E. L.
Mishawaka
Souders, W. S., Sr.
Monticello
Roll, L. G.
Moorsville
Hobson, D. A.
New Albany
Condra, C. E.
Rockport
Oldham, H. G.
Salem
Shrum, G.
South Bend
McClellan, B. G.
Vincennes
Lenahan, C. B.
West Lafayette
Camp, W. E.
Egner, C. A.
McLerran, J. H.

Iowa—14

Adel
Lampe, T. P.
Belmond
Murray, L. W.
Cedar Falls
Wardin, R. W.
Cedar Rapids
Behrens, W. H.
Lilly, J. H.
Messenger, A. R.
Council Bluffs
Mayne, J. H.
Davenport
Tunnicliff, R. G.
Zieke, G. F.
Eagle Grove
Kirchoff, L. J.
Emmetsburg
Thompson, D. H.
Fort Dodge
Miller, G. H.
Hazelton
Watson, G. M.
Ottumwa
Upp, O. T.

Kansas—9

Ashland
Robbins, E. L. V.
Dodge City
Davis, D. V.
Lawrence
Haines, D. D.
Jenks, G. F.
Manhattan
White, L. V.
Mankato
Mayse, M. M.
Marion
Meisner, J. F.
Overland Park
Ware, C. L.
Wichita
Landis, M. P.

Kentucky—12

Danville
Hamke, R. F.
Elizabethtown
Birdseye, S. H.
Howel
Wilson, J. K.
Lexington
Miles, P. M.
London
Graham, J. H.
Louisville
Lodge, F. H.
Riley, F. C.
Wendt, W. B.
Madisonville
Donan, J. G.
Paducah
Hollis, E. Y., Jr.
Pineville
Fleeman, R.
South Carrollton
Pope, F. H.

Louisiana—21

Alexandria
Lafargue, I.
Baton Rouge
Eubank, B. J.
Hayne, H. M.
Nilson, E. R.
Crowley
Letz, P. J.
Gretna
McLendon, G.
Hammond
Daniel, R. L.
Keck, W. G.
Harvey
Brawley, A. L.
LaFayette
Chance, J. E.
Monroe
Andrews, A. P.
Garnett, Y. S.
Huey, S. E.
Morgan City
Ingram, J. D.
New Orleans
Chapman, S. P.
Toler, J. S.
Turner, W. A.
Shreveport
Porter, T. P., Jr.
Sulphur
LeVasseur, A. J.
Vidalia
Sessions, J. P.
West Monroe
Temple, F. A.

Maine—2

Machias
Mawhinney, R. A.
Orono
Kinney, R. A.

Maryland—116

Aberdeen
Nolen, J. A.
Annapolis
Carr, J. R.
Hicks, J. D.
McCrone, J. R., Jr.
Baltimore
Beavin, B. E.
Britcher, K. E.
Brown, A. H.
Brown, L. A.
Cassell, G. W.
Childs, W. F., Jr.
Dill, P. A.
Emminizer, G. K., Jr.
Ewell, W. H.
Graff, J. E.
Hacker, T. W.
Hoke, W. B.
Hunt, J. C.
Jungers, A. F.
Kirby, E. J.
Merriam, C. F.
Pfeifer, R. S.
Pohmer, A. E.
Primrose, W. H.
Pritchett, N. M.
Rudolph, H. R.
Steinberg, J.
Supp, C. W. A.
Sutcliffe, D. K.
Tarcza, F. J.
Weissenstein, H. G.
Bethesda
Davidson, J. I.
Druhot, G. S.
Gioiosa, A. A.
Glassberg, H. I.
Lane, F. B.
Price, M. M.
Simonson, W. H.
Wilson, R. M.
Bladensburg
Junek, F. F.
Cabin John
Hill, M. E.
Capitol Heights
Swick, C. H.
Cheverly
Davis, W. S.
Sawchuk, H. A.
Strees, L. V.
Chevy Chase
Berry, R. M.
FitzGerald, G.
Kelly, G. R.
Norcross, T. W.
Randall, R. H.
Riemer, A. A.
College Park
Noble, A. G.
Cumberland
Davis, A. D.
District Heights
Hutchison, J. P.
Easton
Blain, R. H.
Edgewater P. O.
Latimer, P. A.
Ellicott City
Skinner, C. M., Jr.
Frederick
Walter, W. R.
Frostburg
Espy, J. S.
Fullerton
Shoemaker, W. L.
Gaithersburg
Seaquist, E. O.
Hyattsville
Baird, W. E.
Dyer, B.
Fonfara, E. W.
Ford, H. S.
Gornitsky, R.
Huffaker, C. L.
Skelton, R. H.
Venezky, M. S.
Kensington
Dunich, J. P.
Ofenstein, C. E.
Overstreet, W. B.
Zimmerli, A. B., Jr.
Laurel
Cockey, V. D.
Wills, G. A.
Marlboro
Banks, W. G.
Mountain Lake Park
Martini, A. B.
Mt. Rainier
Yates, S.
North East
DeLancey, J. B.
Seat Pleasant
Holl, R. C.
Silver Spring
Andregg, C. H.
Berman, C. A.
Black, L. D.
Delaney, M. S. A.
Ellis, W. T.
Everett, G. H.
Greathouse, W. C.
Hain, E. L.
Hanrahan, V. J.
Hopkins, P. F.
Hoshide, T.
Kowalczyk, C. E.
Materazzi, A. R.
Skop, J.
Tewinkel, G. C.
Spencerville
Shaw, E. M., Jr.
Suitland
McCurdy, P. G.
Medina, G.
Takoma Park
Boutwell, J. W., Jr.
Davey, C. H.
Gilchrist, C. F., Jr.
Griffin, E. M.
Johnson, S. M.
Maloy, F. J.
McNeill, T. B.
Nahas, G. F.
Thompson, H. F.
Wharton, L. C.
Timonium
Rader, L. W.
Towson
Dollenberg, F. H.
Maynadier, W. M.
Stephens, G. W., Jr.
West Chevy Chase
Simonpietri, A. C.
West Hyattsville
Brierly, W. B.
McAlinden, J. M.
Rosenbaum, M. A.
Wheaton
Oyster, T. G.

Massachusetts—42

Assinippi
Jacobs, L. H.
Boston
Baird, C. O., Jr.
Berger, L. H.
Houdlette, E. C.
Hughes, R. F.
Johnson, E. A.
McCormick, T. E.
Morrison, H. A., Jr.
Ullian, H. B.
Braintree
Webb, F. T.
Brookline
Power, J. G.
Buzzards Bay
Snow, N. B.
Tyson, J. L.
Cambridge
Breed, C. B.
Raisz, E.
Shea, H. J.
Carlisle
Brown, M. A.
Dennisport
Chase, B. P.
Sweetzer, S. R.
Foxboro
Lienesch, J. P.
Framingham
Schofield, L. T.
Franklin
Chilson, J. W.
Malden
Osgood, G. R., Jr.
Mansfield
Christenson, J. A.
Natick
MacCarthy, R. E.
Needham
Cheney, F. L.
Woodbury, R. L.
Orleans
Schofield, W. L.
Palmer
Dingman, R. O.
Sullivan, A. E.
Reading
Fairclough, W. T.
South Deerfield
Ainsworth, G. E.
Springfield
Anderson, C. E.
Way, A. F.
Walpole
McIntyre, K. E.
Waltham
Stearns, E. O.
Ware
Casey, J. T.

Westfield
Scott, H. E.
Weston
Slayter, R. S.
Worcester
Turner, J.
Robinson, H. C.
Yarmouthport
Kelly, W. D.

MICHIGAN—55

Alpena
Scott, R. S.
Ann Arbor
Bleekman, G. M.
Bouchard, H.
Hicks, H. S.
McFarlan, H. J.
Young, E.
Baldwin
Blass, G.
Caro
Black, R. J.
Charlevoix
Feindt, Mrs. M. C.
Dearborn
Stringer, E.
Detroit
Basney, J. N.
Buskirk, P. V.
Cantrell, T. B.
Chope, I. E.
Fall, L. W.
Healey, H. A.
Jewell, L. V.
Knight, C. E.
Laidly, W. T.
Lincoln, W. M.
Loeffler, M. M. J.
McMahon, J. J.
McMahon, V. P.
Partyka, J. C.
Querfeld, D. W.
Ross, C. F.
Ryba, H. H.
Salle, J. H.
Smith, V. A.
East Lansing
Nothstine, L. V.
East Tawas
Cooke, R. J.
Flint
Aikman, C. F.
West, R. C.
Grand Rapids
Donker, R. F.
Williams, W. B.
Harrisville
Holmes, J. H.
Highland Park
Beckley, L. D.
Ishpeming
Cleveland-Cliffs Iron Co.
Jackson
Harvey, M. S.
Lansing
Abrams, T.
Berryman, W. C.
Karr, W. S.
Tiedeman, G. W.
Menominee
Roberts, K.
Midland
Reed, A. C.
Mt. Pleasant
Preston, H. A.
Paw Paw
Smith, W. Q.
Plymouth
Bathey, D.
Pontiac
Baldwin, M. E.
Port Huron
Leach, T. L.
Roscommon
Henning, G. D.
Saginaw
The Lufkin Rule Co.
St. Clair Shores
Sickelsteel, M. E., Jr.
Sandusky
Scott, W. G.
Suttons Bay
Brehmer, H. H.

MINNESOTA—28

Albert Lea
Jones, C. V.
Detroit Lakes
Nedberge, C. J.
Duluth
Pera, A. H.
Ely
Norby, E. A.
Fairmont
Jones, F. O.
Fergus Falls
Bjorgum, K. T.
Foley
Kotsmith, J. D.
Forest Lake
Lathrop, B. G.
International Falls
Wood, L.
Mankato
Kircher, A. M.
Minneapolis
Boon, L. F.
Lundstrom, W. J.
Nowak, O. G.
Peterson, E. R. T.
Paynesville
Miller, A. S.
Princeton
Hoeft, F. R.
St. Louis Park
Hofstrand, H. L.
Madson, C.
St. Paul
Donaghue, J. P.
McNally, L.
Ramlow, W. G.
Skooglum, O. J.
Sullivan, J. N.
Weber, D. O.
Wilke, H. A.
Sebeka
Howard, J. E.
Virginia
Lambert, L. E.
West St. Paul
McLagen, P. R.

MISSISSIPPI—14

Canton
James, M. H., Jr.
Centerville
Farrar, A. K.
Crosby
Wilkinson, W. H.
Jackson
Dean, M. E.
Hardy, G. D.
Kajdan, H. A.
Miller, A. C.
Miller, C. L.
Mills, F.
Paxson, R. K.
Picayune
Lee, D. R.
Smithdale
Westbrook, V. C.
Sumner
James, M. H., Sr.
Tupelo
Bunch, F. M.

MISSOURI—158

Carthage
Glenn, E. S.
Cassville
Mitchell, S. E.
Columbia
Rubey, H.
Greenville
Harris, W. C.
Kansas City
Brunson Inst. Co.
Clute, H. M.
Owens, E. H.
Kennett
Redman, C. C., Jr.
Newburg
Gaddy, J. H.
Rolla
Ackerson, C. H.
Adam, H. E.
Allred, E. L.
Austin, J. S.
Bagrowski, B. P.
Bailey, A. B.
Baker, G. J.
Baker, Q. E.
Barritt, C. L.
Bartol, R. G.
Bates, F. J.
Batson, W. C.
Batteen, E. R.
Barry, J. T.
Berry, P. P.
Bertsch, R. E.
Boeckman, G. O.
Boekenkamp, R. L.
Brady, S. B.
Brever, M. H.
Broshot, A. E.
Brown, J. L.
Brown, W. W., Jr.
Bruno, E. W.
Canfield, J. B.
Carey, R. E.
Carmichael, P. J.
Chesebrough, S. A.
Cissna, V. J., Jr.
Clark, M. W.
Collier, R. M.
Crangle, D. E.
Crowell, H. G.
Detjen, R. F.
Duvall, J. W.
Einarson, R.
Elledge, W. C.
Eshbaugh, C. W.
Eubanks, R. W.
Evans, J. A.
Farmer, S. D.
Ferguson, R. F.
Fiebelman, J. P.
Finch, J. D.
Fisher, J. R.
Followill, R. J.
French, J. H.
Gehres, W. S.
Geurin, J. W.
Ginter, E. L.
Gleissner, M. J.
Gosen, J. W.
Gouchenour, E. W.
Greenwood, H. E.
Grimm, L. E.
Hall, H. S.
Harden, M. J.
Harding, C. E.
Hart, D. L.
Henningsen, J. N.
Hippler, B. E.
Holloway, C. F.
Hughes, T. A.
Jackson, E. A.
Johnson, L. L.
Johnson, M. G.
Johnston, H. M., Jr.
Jolly, J. J.
Jones, M. R.
Kablesh, H.
Kallbrier, J. E.
Kennedy, D.
Kennedy, W. V.
Kimmick, E. J.
Klein, I.
Kuhn, A.
Laird, R. M.
Lambelet, L. E.
Lavery, F. G.
Lawson, J. M.
Leachman, J. B.
Lentz, F. C.
Leonard, R. H.
Little, R. E.
Lyon, P. C.
Markussen, K. M.
Marsden, L. E.
McCann, J. J.
McCaw, C. W.
McClellan, M. C.
McCutchen, A. C.
McDaniel, J. D.
McGregor, J. W.
McHugh, J. J. P.
Miller, C. E.
Milsted, H. S.
Nelson, I. E.
Orelup, I. C.
Osaka, W. K.
Parker, C. H.
Pinkston, S. W.
Price, A. E.
Ranney, T. T.
Ransom, J. G.
Roberts, R. G.
Robison, L. B.
Ross, L. E., Jr.
Ross, R. R.
Rother, W. M.
Rowden, H. R.
Roy, C. W.
Ryan, J. P.
Sabo, E. L.
Sanders, B.
Schooler, M.
Schreiner, G. O.
Schultz, J. T.
Shields, J. M.
Shulze, E. R.
Shumate, J. A.
Simmons, J. W.
Sites, L. E.
Smith, J. F. W.
Somers, J. W. V.
Springsteen, H. L.
Steinmetz, L. E.
Stites, C. L.
Tanaka, H. H.
Taylor, I. G.
Tex, G. N.
Thompson, M. V.
Tuley, F. W.
Turner, C. E.
Walker, L. B.
Wallace, D. C.
Wehmeier, R. E.
Weishapple, C. E.
Whaley, F. L.
Wilkinson, E. C.
Williams, J. J.
Williams, L. E.
Williamson, R. E.
St. Louis
Cortright, D. N.
Dale, R. E.
Salem
Hawkins, I. J.
Springfield
Kastendieck, G. H.
Warrensburg
Webb, J. A.
Webster Groves
Larson, L. M.
Palm, R. C.

MONTANA—9

Billings
Crawford, T. W.
Knowles, J. S.
Scott, D. K.
Box Elder
Dickson, G. M.
Great Falls
Lemmer, C.
Libby
Miller, I. C.
Miles City
Wynn, T. M.
Missoula
Peterson, V. R.
Troy
Ninneman, J.

NEBRASKA—7

Bassett
Hebb, L. E.
Grand Island
Towey, L. A.
Lincoln
Garber, M. L.
Omaha
Reed, R.
Papillion
Beadle, I. C.
Pender
Racely, W. A.
Wauneta
Athey, H. E.

NEVADA—3

Carson City
Guinn, R. F.
Rell, O. E.

Reno
Curran, J. E.

New Hampshire—4

Alstead
Chase, H.
Amherst
Stockwell, D. M.
Nashua
Willard, A. K.
Plymouth
Trojano, H. D.

New Jersey—75

Allendale
Beswick, H. W.
Bayonne
Frank, T. C.
Beachwood
Doscher, G. E., Jr.
Belvidere
Hampton, W. J., Jr.
Bridgeport
Minckler, H. G.
Brigdeton
Huber, L. A.
King, G. M.
Caldwell
Demarest, L. B.
Camden
Robertson, A. C.
Clifton
Gardner, F. W.
Delanco
Ash, S. B.
East Paterson
Goble, W. C.
Freehold
Horn, E.
Glendora
Weatherby, R. C., Sr.
Haddonfield
Steel, G. J.
Hoboken
KeuTel, C. W.
Jersey City
Curley, J. P.
Scott, L. S.
Kearny
Swaim, C. H.
Kenvil
Pesce, F.
Lakewood
Larrabee, B. M.
Waddill, G. B.
Lavallette
Evans, C. C.
Manasquan
Jorgensen, G. C.
Manville
Kachorsky, M. S.
Maplewood
Robbins, J. M.
Metuchen
Buchanan, W. F.
Milford
Wean, E. L., Jr.
Morristown
Edwards, R. C.
Neptune
Erb, R. W.
Newark
Borrie, A. M.
McDonald, F. H.
New Brunswick
Moselowitz, H. G.
Wilson, R. P.
New Market
Kupper, C. J.
North Bergen
Montagne, L. D.
Runge, F. P.
North Plainfield
Carroll, R. M.
Oakhurst
Postel, A. F.
Passaic
Chypak, J.
Phillipsburg
Rice, P. P.
Plainfield
Lewis, E. R.
Lewis, E. S.
Vliet, G. B.
Pompton Plains
Demler, L. E.
Port Norris
Bennett, J. H.
Princeton
Irish, S. B.
Kissam, P.
Pranis, P. E.
Ridgefield Park
Ralston, H. J.
River Edge
Carey, W.
Rockaway
Collict, K.
Roselle
Green, J. D.
South Amboy
Mitchell, T. F.
South Orange
Redfern, J. H.
Spring Lake
Schmieder, E. H.
Summit
Aurnhammer, W. L.
Keller, W. G.
Woodside, P. R.
Teaneck
Hartman, P.
Schwanewede, W. H.
Trenton
Blanchard, R.
Deininger, C. E.
Hutchins, J. F.
Lehman, L.
Stout, D. L.
Verona
Deiller, H. E.
Vineland
Bernard, A. E.
Wallington
Konikowski, E. G.
Wharton
Williams, C. A.
Wildwood Crest
Middleton, C. B.
Williamstown
McClennen, F. H.
Wood-Ridge
Bacheller, M. A.
Woodcliff Lake
Sielke, A. L.
Wyckoff
Kaeffer, C. D.

New Mexico—8

Alamogordo
Makar, O.
Albuquerque
Anderson, B. D.
Elder, E. K.
May, M. C.
Las Cruces
Mobley, R. L.
Las Vegas
Beisman, H. E.
Los Lunas
Sandoval, P.
Roswell
Gregg, A. B.

New York—151

Albany
Gilbert, R. E.
Allaben
West, E. G.
Amityville
Hirsch, E.
Baldwin
Wilhelm, R.
Babylon
Tompkins, H. C.
Weaver, D. A.
Bay Shore
Bartley, R. J.
Bellmore
Pfleiderer, F. C.
Brightwaters
Kime, B. C.
Bronx
Ranhofer, C. A.
Brooklyn
Caesar, A. M.
Dill, H.
Donahoe, J. T.
Lupo, J. M., Jr.
Risso, J. J.
Carmel
Burgess, R. A.
Kamp, W.
Deer Park
Evers, W. E.
Farmingdale
Patrick, W. R., Sr.
Far Rockaway
Vandewater, W. H.
Fayetteville
Lamprecht, J.
Floral Park
Parry, W. H.
Smith, A. H. B.
Flushing
Schenck, W. H.
Freeport
Baldwin, A. J. C.
Cornelius, J. D.
Johannemann, E.
Larner, J. W.
Great Neck
Bartlett, F.
Ward, C. E.
Greenport
Van Tuyl, O. W.
Glen Cove
Smith, C. Y.
Glen Head
Diggory, M. L.
Hampton Bays
Squire, L. W.
Hempstead
Clement, R. L.
DeBeau, E. B.
Debruin, W. E.
Wirth, C. E.
Islip
Van Weele, P. J.
Ithaca
Chang, W.
McNair, A. J.
Shu, C. S.
Spry, F. J.
Underwood, P. H.
Jamaica
Clarke, C. G.
Sanders, R. G.
Jamestown
Peterson, H. N.
Lakeville
Weber, J. C.
Long Island City
Rizzo, J. A.
Lynbrook
McGuire, J. J.
Malverne
Beyer, H. O.
Steinbrenner, E.
Teas, H. J.
Manhasset
Meyer, W. H.
Peets, S. H.
Maple View
Hanlon, J. A.
Massapequa
Lind, C. G.
Merrick
Bunker, H.
Mexico
Hill, C. E.
Mineola
Cogliandro, R. J.
Fairfield, G. A.
Shields, J. J.
Weckerle, C. H.
Mount Vernon
Brienza, P. I.
Young, C. A.
New York City & c/o P.M.
Alexander, G. L.
Barry, B. A.
Bellerue, V. L.
Belote, E. S.
Burney, L. M.
Eckerson, S. J.
Eichler, J. O.
Emery, S. A.
Gausmann, R. W.
Harrison, R. E.
Harwood, J.
Haupt, R. W.
Helm, L.
Hunkapiller, B. B.
Laird, M. O.
LaMont, R. E.
Martens, A. G.
Maynard, C. F.
Miller, O. M.
Mirgain, F. C.
Murphy, W. D.
Narins, C. S.
Norton, H. J.
Ober, C. H.
Orrell, K. P. M.
Porter, N.
Rasche, H. H.
Rosenbaum, C. R.
Schofield, C. O.
Thorne, S., Jr.
Trowbridge, D. S.
Voegelin, P. F.
Wright, J. K.
Oceanside
Bausch, C. E.
Olean
Austin, W.
Owego
Robertson, J. F.
Ozone Park
Dornhoefer, L.
Schaefer, A.
Parish
Church, E.
Patchogue
Norton, N. C.
Pelletreau, J. R.
Pearl River
Lent, W. B.
Peekskill
Irish, J. W.
Pelham
Herbell, C. P.
Port Jefferson
Hawkins, H. P.
Tuthill, H. T.
Port Jervis
von Sauers, R. J.
Port Washington
Bartlett, H. N.
Poughkeepsie
Moran, E. A., Jr.
Riverhead
Young, A. W.
Rochester
Hayes, H. H
Reynolds, K. E.
Sharp, J. V.
Sparling, R. J.
Rockville Centre
Fenton, J. V.
Voorhis, C. E.
Webster, J. S.
Roosevelt
Pfleiderer, P. L., Jr.
Wood, H. M.
Roslyn Heights
Monroe, C. A.
Schenectady
Male, C. T., Jr.
Taylor, W. C.
Sea Cliff
Dickson, J. H.
Seaford
Grover, J. F.
Loeffler, A. L.
Setauket
Wells, J. W.
Sodus
Braucher, S. L.
Stewart Manor
Hicks, W. T.
Syracuse
Kline, H. V. B., Jr.
Tannersville
Allen, B. F.
Troy
Higbee, L. C.
Knippel, P. R.
Sharp, H. O.
Shaw, G. R.
Valley Stream
Nelson, R.
Wading River
Meier, W. G.
Watertown
Cooper, D. C.
Westbury
Baldwin, M. C.

Bohn, J. J.
Nelson, E. N.
West Point
Hillberg, L. J.
Schick, L. E.
Woodmere
Disher, Q. F.
Yonkers
Brown, A. L.
Steinkamp, J. C. H.
Yorktown Heights
Frommholz, H. E.

North Carolina—41

Angier
Young, O. S.
Badin
Bisel, R. E.
Candler
Hutchison, F. L.
Canton
Terrell, H. K.
Chapel Hill
Gove, J. R.
Charlotte
Kirkman, B. E.
Leonard, E. C.
Cullowhee
Turner, W. N.
Durham
Cote, D. N.
Elizabethtown
Robbins, A. A.
Elon College
McAdams, J. M.
Franklin
Sloan, W. N.
Fuquay Springs
Russum, C. W.
Greensboro
Scott, R. F.
Walker, N. G.
Hertford
Cox, D., Jr.
Hickory
Miller, R. F.
High Point
Freeman, W. F.
Kinston
Jenns, P. A.
Laurinburg
Johnson, R. S.
Mt. Airy
Goldsmith, W. W.
Oxford
Southerland, O. P.
Pineville
Carothers, L. E.
Raleigh
Hampton, A. G.
Pou, J. F.
Roanoke Rapids
Shearin, J. C.
Waters, C. C.
Sanford
Eakes, J. C.
Shannon
Harrell, G. S.
Stanley
Cavin, W. M.
Tarboro
Wilson, R. F.
Trenton
Burt, J. R.
Troy
Furr, J. M., Jr.
Tryon
Frankenfield, H. B., Jr.
Wallace
Vann, H. J.
Washington
Jackson, G. E.
Wilmington
Hill, W. B., Jr.
Lasak, G.
Wilson
Ellis, L. L.
Wiunabow
Hewitt, H. R.
Winston-Salem
King, P.

North Dakota—2

Fargo
Henry, L. O.
Kenmare
Murphy, W. J.

Ohio—73

Akron
Kingsley, D. T.
McDonald, E. J.
Swigart, S. T.
Ashtabula
Candela, J.
Athens
Ali, A.
Clark, G. W.
West, G. R.
Avon Lake
Burbank, D. S.
Bellefontaine
Inskeep, C. A.
Berea
Thomson, J. M.
Canton
Markley, H. D.
McDermott, L. T.
Rodgers, M. A.
Celina
Fetters, B. D.
Gebhart, B. R.
Cincinnati
Elliott, R. T.
Larson, E.
Cleveland
Bauer, S. A.
Benke, S. H.
Birnbaum, H.
Chabek, A. R.
Cyvas, V.
Earnest, G. B.
Gallimore, H. C.
Gregory, A. V. N.
Grinnell, W. P.
Gulla, C.
Kelsey, R.
Kirlys, P.
Krause, R. H.
Kutis, E.
Lander, W. P.
Lewandorf, S. C.
Logan, R. W.
McSteen, J. E.
Merriman, L. J.
Miller, H. C.
Sanker, F. C.
Schenk, W.
Cleveland Heights
Atkinson, A. C.
Stoller, F. E.
Columbus
Byrd, W. O.
Harding, G. H.
Harvey, F. K.
Schreiter, J. B.
Dayton
Deeg, J. J.
Gehrke, R. F.
Preston, H. W.
Spahn, G. J.
Speer, H. E.
East Cleveland
Powers, A. T.
Kent
Stockman, W. J.
Lakewood
Stroebel, H. J.
Lancaster
Bender, T. F.
Lima
Ash, C.
Maumee
Barton, G. M.
Gainer, C. E.
Orrville
Krichbaum, F. D.
Painesville
Fullerton, C. S.
Kerr, V. H.
Portsmouth
West, G. R.
Powell
Rowell, E. M.
Ravenna
Shafer, P. C.
Rocky River
Goebl, A. J.
Schneider, J. R.
St. Clairsville
Davis, J. M.
Springfield
Eastman, R. F.
Toledo
Linton, R. N.
Willoughby
Riley, F. N.
Youngstown
Coope, A.
Goldman, M.
Gould, S., Jr.
Hughes, R. H.

Oklahoma—15

Bartlesville
Moore, W. P.
Cardin
Stroup, R. K.
Fort Sill
Deane, W. F.
Grapes, H. E.
Miami
Coulter, D. M.
Oklahoma City
Edin, R. J.
Pauls Valley
Rennie, A. M.
Tulsa
Benish, A. A.
Bledsoe, C. C.
Daughetee, E. E.
Harvey, C. J.
Kiff, G. P.
Meeks, W. R.
Roberts, V.
Whitaker, R. L.

Oregon—45

Drain
Haines, W. N.
Eugene
Gierhart, J. W.
Greenup, W. E.
Hammond
McKiddy, P.
Klamath Falls
Howard, F. Z.
Langall, F. C.
Lakeview
Tyler, G. E.
Lebanon
Whitcomb, G. E.
Manhattan Beach
Cross, G. M.
Medford
Eslinger, T. R.
Higgins, D. L.
Hoffbuhr, J. A.
Milwaukie
Barrett, E. W.
Oak Grove
Mason, R., Jr.
Oregon City
Milne, D. E.
Portland
Barton, J. C.
Boyd, M. J.
Flach, V. H.
Grambo, A. S.
Lamberson, R. E.
Marx, D. E.
Miller, H. P.
Oros, C. N.
Pabst, V. H.
Riddell, F. A.
Riley, T. E.
Schminky, H. B.
Smith, H. A.
Travis, L. M.
Tubbs, L. S.
Williams, V. S.
Redmond
Mansfield, E. G.
Roseburg
Evans, A. R.
Irving, B. B.
Salem
Barnes, R. C.
Bates, D. F.
Beardsley, M. C.
Clark, W. W.
Cushing, B. F.
Gemunder, D. K.
Graham, A. D.
Johnson, B. O.
West, T. W.
Sweet Home
Parker, J. M.
Vale
Sandquist, W. E.

Pennsylvania—67

Aliquippa
Kronk, M. E.
Allentown
Kramlich, R. F.
Bethel
Ziegler, R. K.
Bethlehem
Remaly, C. D.
Carnegie
Swiech, P. C.
Clarion
Lewis, G. R.
Taylor, L. S.
Collegeville
Meixner, H. F.
Connellsville
Raymond, C. R.
Coopersburg
Heller, K. J.
Dillsburg
Lowry, R. W.
Miller, J. V.
Easton
McNeal, J., 3rd
Emmaus
Heffner, I. R.
Factoryville
Seamans, A. E.
Fairview
Weislogel, C. L.
Greentown
Schoenagel, F. C.
Harrisburg
Fluent, C. H.
Harvey, L. S.
LeVan, H. A., Jr.
Lollich, P. M.
Patterson, J. A.
Hollwood
Cassell, F. B.
Hustontown
Malot, J. W.
Indiana
Playfoot, C. L.
Jackson
Kingsbury, E. T.
Jeannette
Beck, E. L.
Lancaster
Ritz, H. F.
Lewisburg
Weedon, H. A.
Ligonier
Ross, B.
Lincoln Park
Swartz, W. H.
Norristown
Schurr, D. H.
Oreland
Quinn, A. O.
Parkers Landing
McCall, J. S.
Pennside
Angstadt, O.
Philadelphia
Alteneder, T. G.
Dupuy, E. P.
Kauffman, V.
Kelly, J. G.
Patterson, M. B.
Perkins, B. C.
Sciambi, B. E.
Smith, R. H.
Storms, C. E.
Turner, A. W.
Pittsburgh
Aires, B. H.
Kerr, J. J.
Nemmer, J.
Scott, J. L.
Thomas, H. E.
Thompson, J. M.
Point Marion
Cubbage, J. M.
Port Allegany
Lovell, C. V.
Rochester
Baker, M., Jr.
St. Marys
Donahey, W. L.

Sayre
Jones, G. K.
Saxton
Sheterom, V. E.
Shamokin
Yocum, W.
Somerset
Neilan, F. G.
State College
Perez, L.
Thompson
La Barre, L. L.
Verona
Brush, D. V.
Washington Crossing
Park, J. G.
Westchester
White, H. R.
West Newton
Stevenson, A. M.
Wilkes-Barre
Gula, M. J.
Wilkinsburg
Mullan, R. H.

Puerto Rico—3

Hato Rey
Pabon, R.
Naranjito
Suarez, R. I.
Rio Piedros
Barea, S.

Rhode Island—3

Anthony
Matteson, R. C.
Valley Falls
Curtis, W. D.
West Kingston
Moultrop, K.

South Carolina—4

Aiken
McMillan, M. G.
Charleston
Key, J. C.
North Augusta
Grant, J. L.
Walterboro
Fripp, H. M.

South Dakota—2

Pickstown
Bonhorst, L. W.
Sioux Falls
Sheridan, F. J.

Tennessee—27

Brownsville
Carter, F. W.
Chattanooga
Betts, C. A.
Curtis, R. V.
Dittmer, R. S.
Frierson, R. E.
Holmes, B. O.
Loomis, F. S.
Massa, W. S.
Miles, W. P.
Moore, R. L.
Morris, P.
Prigmore, W. A., Jr.
Reams, C. C.
Soehle, B. L.
Clinton
Brock, H. M.
Dayton
Uzefovich, A. M.
Elizabethton
Thomas, M. C.
Greeneville
Bowman, D. A.
Knoxville
Aiken, H. B.
McDonald, J. E.
Parker, C. O.
LaFollette
Thomas, L. H.
Memphis
Newman, J. R.
Nashville
Sullivan, J. M.
Sumner, B. T.
Winn, W. B.
Shelbyville
Smith, A. G.

Texas—166

Alice
Embry, W. S.
Angleton
Walsh, W. C.
Aransas Pass
Heinrichs, C. C.
Austin
Barclay, L.
Benish, A.
Freeman, J. D.
Morgan, C. W.
Morriss, G. C.
Turpin, R. D.
Watson, J. T.
Bay City
Lemoine, J. C.
Rother, J. F.
Watkins, P. V.
Baytown
Ehrhardt, W. E.
Kelley, R. W., Jr.
Beaumont
Cruise, R. B.
Norris, L. V.
Tetley, W. R.
Bellaire
Britain, K. E.
Croley, J. M.
Thornton, S. E.
Big Spring
Baker, R. W.
Dehlinger, M. E.
Brady
Trigg, A. G.
Cleburne
Adams, L. M.
College Station
Newton, T. R.
Orr, J. A.
Conroe
Waddill, J. P.
Corpus Christi
Blucher, C. M.
Gerber, R. G.
Green, W. W.
Perkins, E. R.
Dallas
Berkley, F. L.
Boot, G. W.
Burkart, W. J.
Clark, A.
Fleming, L. C.
Jackson, L. O.
McCarty, M. D.
McIntosh, W. L.
Rhodes, C. L.
Robinson, W. B.
Smith, S. G.
Watts, R. G.
Edinburg
Melden, C. L.
Floydada
Newell, W. D.
Fort Worth
Hawkins, L. M.
Rigg, B. H.
Rounds, W. A.
Grossbeck
Leach, W. W.
Houston
Adams, D. H.
Akkerman, W. H.
Atkinson, C. W.
Atkinson, E. S.
Atkinson, R. M.
Bennett, J. F.
Berry, D.
Boddeker, R. E.
Boyles, J. S.
Brandt, E. D.
Brownlee, J. H.
Burnett, E.
Butler, E. S.
Carr, L. P.
Cole, M. B.
Cornitius, L. E.
Crosser, R. E.
Daley, R. K.
Daniell, W. F.
Dornier, F. L., Jr.
Durham, J. H.
Dye, L. A.
Ehman, J. D.
Ewing J. C.
Gacke, R. J.
Graham, J. P.
Griffin, I. M., Jr.
Guenzel, W. T.
Hatcher, R. V.
Herzog, G. W.
Hicks, J. A., Jr.
Hughes, J. W.
Jackson, A. L.
James, C. A.
Japhet, G. T.
Johnson, H. J.
Jordan, R. A., Jr.
Keller, B. R.
King, C. E.
Kingsland, L. M.
Kropet, H. J.
Lacy, G. H.
Lozano, M.
Livingston, G. M.
Maidlow, D. K.
Mason, H. E.
McKnight, C. P.
Miller, B.
Mills, R. E.
Morse, E. D.
Mutersbaugh, W. G.
Oberg, S. W.
Pope, J. G.
Rains, L. J.
Ray, R. H.
Reid, R. L.
Sargent, R. L.
Sartain, R. R.
Savage, F. D.
Sharpe, L.
Smith, L. A.
Stickle, G.
Still, B. L.
Stramler, J. W.
Strickert, H. F.
Strickert, R. R.
Tasker, A. D.
Tomlinson, J. A.
Walston, V. A.
Warren, W. J.
Washburn, R. A.
Webb, C. J.
Welborn, M.
West, H. L.
Whitlock, J. D.
Wildman, C. M.
Wilkinson, P. T.
Wilson, W. H.
Wiseman, P. W.
Ybarquen, R.
Young, A. L.
Young, O. E.
Zingery, W. W.
Jacksboro
Van Dyke, A. J.
Jourdanton
Cobb, D. C.
Laredo
Foster, E. J.
Liberty
Partlow, R. G., Jr.
Livingston
Jones, C. R.
Marfa
Thee, N. M.
McAllen
Roberts, J. G.
Midland
Armstrong, C. T.
Creath, N. B.
Moncrief, L. H.
Westerfield, W. S.
Mt. Pleasant
Burton, W. A.
Nacogdoches
Williams, J. A.
Pearsall
Schorp, F. J.
Plainview
Williams, W. J.
Refugio
McMullen, W. H.
Rio Grande City
May, J. H.
San Antonio
Ammann, J.
Boothe, Z. J., Jr.
Brown, H.
Chang, W.
Drought, F. T.
Ferguson, M. L.
Grothaus, F. E.
Kargl, G.
Slocum, R. G.
Woodward, L. A.
Seminole
Knott, R. J.
Tyler
Hilton, T. E.
Hudnall, J. S.
Smith, F. D.
Victoria
Ford, D. G.
Wichita Falls
Sherfesee, C. M.

Utah—5

Manti
Antrel, A. C.
Ogden
Morrison, L. J.
Salt Lake City
Adams, T. C.
Brown, A. W.
Larson, L. A.

Vermont—3

Northfield
Thieme, R. W.
Rutland
McCammon, R. L.
St. Johnsbury
Southard, R. B., Jr.

Virgin Islands—1

St. Thomas
George, F. C.

Virginia—198

Abingdon
Cumbow, A. L., Jr.
Accomac
Gibb, J. B.
Alexandria
Arneson, C. L.
Cude, W. C.
Dodd, O. E.
Durkin, J. J.
French, R. J.
Holland, E. S.
Kennedy, T. J., Jr.
Knezovich, F. M.
Manor, C. R.
Nixon, R. W.
Richardson, J. R.
Richardson, S. C.
Scales, W. P.
Streeter, G. H.
Ullom, M. R.
Whitaker, R. E.
Wittmann, C. R.
Woo, H. W.
Wright, M. S., Sr.
Annandale
Ghent, V. H.
Nelson, R. M.
Arlington
Altenhofen, R. E.
Amstadt, J. M.
Angell, C. D.
Arlosky, C. F.
Ask, R. E.
Atkins, C. R.
Bailey, J. K.
Barthold, E.
Beitle, R. L.
Blankenbaker, F. F.
Bodemer, P. E.
Bon Durant, E. V.
Brew, A. N.
Brubaker, J. I.
Buckey, C. W.
Budnick, M.
Bullard, E. F.
Bussell, C. T.
Carey, R. J.
Cayce, T. W.
Chute, G. L.
Chute, K. M.
Corn, L. H.
Crowther, G.
Custidero, L. R.
Darnell, R. C.

Denault, M. F.
Dobbins, J. D.
Drake, J. H.
Elkins, F. S.
Farrell, R. J.
Ferguson, R. C.
Gerster, G. F.
Gomolka, E. G.
Grunwell, G. S.
Haas, C. W.
Hallmark, N. T.
Hathorn, S. J.
Housman, B.
Human, C. B.
Krahmer, E. A.
Landen, D.
Law, J. A.
Lee, R. O.
Lewis, Mrs. D. C.
Lorenz, G. G.
Loud, E. L., Jr.
Luckus, J. W.
Lycett, J. H.
Mager, C., Jr.
Maki, K. N.
Mann, F. M.
Mathias, J. A.
Mattingly, J. A.
McAdoo, M. R., Jr.
McClane, J. E.
McMillen, H. J.
Miller, C. I.
Miller, H. J.
Miner, E. O.
Monk, W. S.
Montgomery, S. W.
Moravetz, R. L.
Murphy, C. F.
Neary, F. B.
Nikolaus, J. D.
Nottage, C. W.
O'Brien, C. V.
Ortiz, F. J.
Paine, R. H.
Patten, F. E., Jr.
Perkins, E. W.
Pinkston, D. W.
Poling, M. Y.
Pomponio, A. R.
Pryor, W. T.
Sayer, R. E.
Scott, J. P., Jr.
Scoville, R. S.
Shepherd, G. P.
Simmons, L. G.
Spencer, J. W. H.
Sprenkel, J. B.
Spurrier, F. H.
Striker, A. F.
Swift, C. E.
Taylor, W. F.
Thompson, E. M.
Thompson, W. C.
Tomlinson, L. M.
Trow, S. W.
Van Brunt, E. E.
Vaughan, R. W.
Vena, F. P.
Wade, C., Jr.
Walker, H. D.
Ward, W. C.
Webb, H. R.
Webb, J. P.
Westinghouse, G. F.
Wharton, G. E.
Whittemore, R.
Wigglesworth, J. R.
Williams, H.
Zahn, F. H.

Ashburn
Pirola, A. P.

Bedford
Patterson, J. L.

Big Stone Gap
Gillespie, B. S.

Blacksburg
Brinker, R. C.
Morris, F. C.

Culpeper
Boldridge, J.

DeWitt
Butterworth, H. L.

Dinwiddie
Chappell, W. G.

Fairfax
Gleason, W. B.
Johnston, T. H., Jr.
Stoneman, W. G.

Falls Church
Adams, K. T.
Anson, A.
Burns, J. P.
Coggin, H. L., Sr.
Davies, W. E.
Gordon, A. R.
Greenawalt, N. E.
Gribok, Peter
Mitchell, Mrs. M. H.
Munson, A. T.
Palmer, Mrs. M. W.
Perry, C. H.
Reamer, C. A.
Romig, W. W.
Thorpe, C. A., Jr.
Zukowski, V. T.

Fort Belvoir
Diercks, F. O.
Klein, W.
Pennington, J. T.
Robinson, B. A.
Van Sholck, A. W.

Fort Norfolk
Miller, S. W., Jr.

Glouchester
Sinclair, J. K.

Hopewell
Whipp, W. S.

Kenbridge
Blackburn, J. W.

Lexington
Clark, B. S., Jr.

Manassas
Ratcliffe, R. J.

Martinsville
Brown, W. C.

McLean
Maxson, R. O.
Small, J. B.

Newport News
Lyons, W. A.
Pyle, R. F.

Norfolk
Bamforth, C. A.
Bartee, J. H.
Browne, J. J., Jr.
Cherry, A. L.
Freeman, P. D.
Harvey, R. B., Jr.
Laskowski, J.
Seaborg, H. J.
Webb, W. C.

St. Paul
Desmond, W. E., Jr.

South Hill
Cooper, O. L.

Staunton
Crawford, W. A.
Hale, J. S.

Richmond
Clements, E. S.
Foster, J. H.
Guy, B. B.
Harwood, J. E.
Parrish, G. J.
Richwine, M. W., Jr.
Stephens, G. M., Jr.

Roanoke
Roberts, T. M.

Vienna
Kingman, Mrs. M. M.
Voskuil, R. J.

Waverly
Carpenter, L. B.

Williamsburg
Carter, R. V.
McManus, V. D.

Wytheville
Newland, D. E.

Washington—21

Aberdeen
Harpster, R. A.

Coulee Dam
Tiffany, R. K., Jr.

Longview
Floyd, B.
Miller, O. R.

Mount Vernon
Walberg, H. O.

Olympia
Emmick, E. F.

Pullman
Welch, F. W.

Seattle
Berry, C. M.
Chittenden, H. M.
Gernert, C. R.
Hitchings, A.
Hoag, A. L.
Johnson, L. C.
Nelson, G. A.
Richards, E. W.
Sipe, R. J.
Waller, H. H.
Weiss, C.

Shelton
Snelgrove, F.

South Bend
Edwards, M. B.

Walla Walla
Gee, D. J.

West Virginia—11

Bluefield
Schrinner, W. P.

Bridgeport
Poling, A. A., Jr.

Charleston
Catlette, M. C.
Hubbs, G. L.

Clarksburg
Scharper, J. E.

Hammond
Rudy, S. H.

Millwood
King, W. M.

Morgantown
Baker, W. H.
Dunbar, M. F.

Princeton
Gay, H. S.

Raineliе
Hambrick, J. H.

Wisconsin—23

Barron
Johnson, M. G.

Camp McCoy
Ferguson, L. K.

Clintonville
Pelishek, R. P.

Crivitz
Gould, F. P.

Eau Claire
Boyd, R. P.
Mathiesen, J. T.

Green Bay
Hall, R. D.
Rollman, C. W.
Schlei, E. W.

Madison
Robinson, A. H.
Wagner, E. C.
Williams, H. F.

Manitowoc
Mecha, R. B.

Milwaukee
Peterson, R. A.
Ruhloff, R. A.
Salzer, T.

Minocqua
Kowalke, E. F.

Racine
Larsen, J. H.
Shelton, R. F.

Sparta
Bergman, O. O.

Tomahawk
Allman, H. C.

West De Pere
Claridge, G. C.

Wisconsin Rapids
Jero, L. M.

Wyoming—8

Big Piney
Scherbel, P. N.

Casper
Simpson, G. R.
Sturdevant, J. E.
Wilson, T. C.

Lamont
Bellamy, B. C.

Lander
Bishop, F. A.

Riverton
Luers, F.

Torrington
Marks, G. W.

FOREIGN COUNTRIES

Argentina—2

Mendoza
Videla, C. C.

Rosario
Locatelli, D. E.

Australia—5

Canberra, N. S. W.
Lambert, B. P.

East Malvern, Victoria
Kurrle, A. F.

Marrickville, N. S. W.
Hornby, A.

South Brisbane, Queensland
Reilly, S. E.

Sydney, N. S. W.
Hutchison, J. R.

Bolivia—1

La Paz
Ferren, P. N.

Brazil—2

Rio de Janeiro
Cabral, E.
DeMattos, A. H.

British West Indies—2

Kingston, Jamaica
Director of Surveys

San Fernando, Trinidad
Farrell, G.

Canada—37

Aylmer East, P. Q.
Peters, F. H.

Brantford, Ont.
King, S.
Middleton, R. S.

Dartmouth, N. S.
Schofield, E. M.

London, Ont.
Archibald, S. W.

Malartic, P. Q.
Dumas, A.

Montreal, P. Q.
Lindsay, C. C.
Lindsay, R. J.
Peake, E. R. L.

Ottawa, Ont.
Ames, A. J.
Carroll, J.
Hughes, F.
MacIlquham, W. L.
Miller, W. H.
O'Malley, T. M.
O'Neill, J. B.
Robertson, W. G.
Seely, H. E.

Quebec, P. Q.
Barrette, G.
Blanchet, J.
Bourget, A.
Cassista, A.
Cote, G.

Gravel, J.
Savard, P.
Valois, L.
Sherbrooke, P. Q.
Crepeau, A.
Toronto, Ont.
Beatty, F. W.
Britton, G. C.
Fulton, W. J.
Marshall, O. J.
Morgan, J. C.
Wong, M. B.
Vernon, B. C.
Tassie, G. C.
Victoria, B. C.
Andrews, G. S.
Beckton, H. S.
Winnipeg, Man.
Humphreys, W.

CHILE—2

Concepcion
Flores, O.
Valparaiso
Ricke, A.

COLOMBIA—4

Bogota
Silva, M. M.
Valencia, L. F.
Medellin
Mejia, E. J.
Milciades, V. R.

COSTA RICA—1

Alajuela
Fernandez, F. M.

CUBA—3

Havana
Albear, J.
Calvache, A. D.
Faxas, A. A.

DENMARK—3

Copenhagen
Haase, P.
Lauritzen, K.
Simonsen, O.

DOMINICAN REPUBLIC—1

Ciudad Trujillo
Cucurullo, O., Jr.

ECUADOR—1

Quito
Avila, V.

EGYPT—1

Cairo
Younis, M. A.

EL SALVADOR—1

San Salvador
Torres, J.

ENGLAND—3

London
Bell, J.
Godlewski, K.
Stanley, D. R.

ETHIOPIA—1

Dire Dawa
Donovan, T. L.

FRENCH MOROCCO—1

Casablanca
Fisher, D.

GERMANY—1

Munich, U. S. Zone
Messter, E. O.

HAITI—2

Port-au-Prince
Cauvin, A.
Chauvin, E. J.

HONDURAS—1

Tegucigalpa
Stanbrough, G. K.

IRAQ—1

Baghdad
Sevian, V. J.

ISRAEL—3

Tel-Aviv
Margolin, J.
Pick, W.
Yosef, Y. B.

ITALY—1

Palermo
Rizzoni, W.

LEBANON—2

Beirut
Hope, E. S.
Ward, E. B.

MALAYA—1

Malacca
Tait, J. G.

MEXICO—4

Mexico City
Medina, M.
Orozco, I. G.
Tacubaya
Sanchez, P. C.
Vela, G. M.

MONACO—1

Monte Carlo
Nichols, C. L.

NETHERLANDS—5

Bilthoven
Schermerhorn, I. W.
Delft
Doyle, F. J.
Roelofs, R.
The Hague
Scherpbier, B.
Wageningen
Kniphorst, B.

NEW ZEALAND—3

Hastings
Van Asch, H. P. D.
Taupo
Tremaine, R. D.
Wellington
Dick, R. G.

NORWAY—2

Oslo
Schive, J.
Stein, B.

PERU—3

Lima
Casas, M. L.
Castro, A. G.
Johnston, O. D.

PHILIPPINES—2

Manila
Maulawin, S. M.
Poral, A. O.

SAUDI ARABIA—1

Dhahran
Phillips, C. W.

SIAM—1

Bangkok
Nidhes, P. S.

SWEDEN—3

Stockholm
Firman Kjessler & Mannerstral
Hallert, B.
Mannerfelt, C. M.

TURKEY—1

Istanbul-Galata
Yasar, S.

VENEZUELA—12

Caracas
Aguerrevere, P. I.
Castillo, C. J.
Cook, N. T.
Herrera, A. L.
Lowrey, P. O.
Lutchen-Lehn, J. E.
Martin, F. I.
Oyarzabal, O.
Romero, A. C.
Weil, A.
Ciudad Bolivar
Ward, V. A.
Estado Sucre
Mikels, J. V.

T T T

Electronic Depth Recorder Determines State Boundary

THREE-FOURTHS of the cost of an ordinary hydrographic survey was saved with an electronic depth recorder when a portion of the state boundary between Illinois and Kentucky was established recently.

The segment of boundary in question was about 1,200 feet long, located 30 miles up the Ohio River from its mouth. On the Illinois bank at this site, a 625,000 KW steam power plant is to be erected. The state line at this site is defined as a contour line on the Illinois shore 284.3 feet above mean sea level. This level evidently was the low water mark of 1873. The boundary had to be determined in order to fix the location of the marine dock and coal handling facilities for the power plant, and to survey accurately the plant's property lines.

A topographic map of the river-bottom was compiled by running river-bottom cross sections at 75-foot intervals normal to the shore. The instrument used for this surveying project was the Bendix DR-8A depth recorder.

With this instrument it was possible to survey 28 acres in 3 days of field work. This is a saving of 75 percent of the time that would have been required had the job been done by the less accurate lead-line methods.—*Engineering News-Record,* March 13, 1952.

ORGANIZATION OF THE CONGRESS

Committee Chairmen

EXECUTIVE ..... GEORGE H. HARDING

PUBLICATIONS ..... KENNETH T. ADAMS

MEMBERSHIP ..... FRANK S. BORDEN

BUDGET AND FINANCE ..... KENNETH T. ADAMS

PUBLIC RELATIONS ..... ALFRED C. STIEFEL

ANNUAL MEETING ..... CHESTER E. KOWALCZYK

Technical Divisions Chairmen

CARTOGRAPHY ..... GORDON B. LITTLEPAGE
U. S. Coast & Geodetic Survey, Wash., D. C.

CONTROL SURVEYS ..... CARROLL F. MERRIAM
Pennsylvania Water & Power Co., Baltimore, Md.

EDUCATION ..... RUSSELL C. BRINKER
Virginia Polytechnic Institute, Blacksburg, Va.

PROPERTY SURVEYS ..... RALPH MOORE BERRY
4230 Everett St., Kensington, Md.

SURVEYING INSTRUMENTS ..... W. L. EGY
Brunson Instrument Co., Kansas City, Mo.

TOPOGRAPHY ..... CALVIN S. MALTBY
U. S. Geological Survey, Wash., D. C.

Past Presidents

ROBERT H. RANDALL — JOHN S. DODDS (DECEASED)

GEORGE D. WHITMORE — FRANK S. BORDEN

MARSHALL S. WRIGHT — SOL A. BAUER

GERALD FITZGERALD

Business Press, Inc.
Lancaster, Pa.